AMERICA'S LARGEST TEXTILE MONTHLY

COTTON

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The FRANKLIN PROCESS

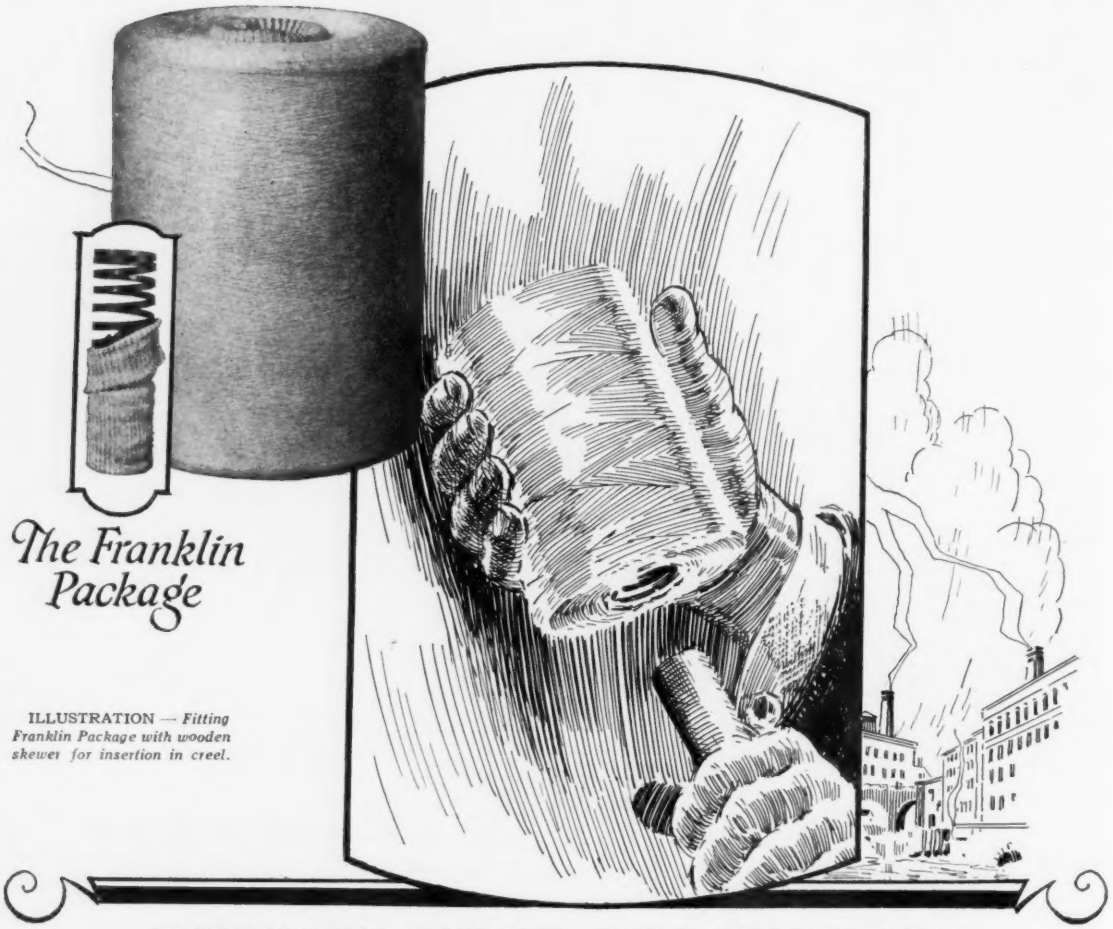

ILLUSTRATION — *Fitting Franklin Package with wooden skewer for insertion in creel.*

ELIMINATES ONE WINDING OPERATION
IN COTTON WEAVING MILL

Chain warp dyeing requires three winding operations:
1—*spooling.*
2—*ball warping.*
3—*beaming.*

Franklin Process dyeing requires two winding operations:
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2—*warping.*

The Franklin Process, in addition to eliminating one winding operation, reduces your investment in equipment by eliminating the necessity for ball warpers or beamers.

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Do you wonder that in the aggregate the use of Franklin dyed and packaged yarn is saving some mills as much as 5c. a pound in winding costs?

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also Yarn Spinners, Manufacturers Glazed Yarns

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New York Office: 66 Leonard Street

SOUTHERN FRANKLIN PROCESS COMPANY
Greenville, S. C.

COMMISSION DYERS OF YARN IN THE WOUND FORM

COTTON

Published Monthly by

W. R. C. Smith Publishing Co., Dalton and Atlanta, Ga.

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Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, notify us, not the postmaster. Always give the old address as well as the new one.

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MATHIESON Chemicals

The Practical Usefulness of Engineering Vision

THREE years ago the Mathieson Company, unaided and with all its resources, undertook the development of a multiple unit tank car for the larger consumer of Liquid Chlorine—an achievement in Chlorine equipment originating in the broad vision and foresight of the Company's engineers and executives.

The scope of that engineering vision included not only the advantages of the ton container to the tank car user of Liquid Chlorine (who existed at that time only in the paper industry) and to the user of standard cylinder equipment, but also the adaptability of this car to consuming problems not then even recognized by other producers.

Now, in April of this year, the Department of Water Supply of the City of New York discontinued their consumption of Liquid Chlorine in cylinders at Ashokan and began chlorination from shipments received in the Mathieson Multi-Unit Tank Car —*the first municipality to adopt this economy.*

By July first of this year, six of the leading textile mills in the progressive Southern manufacturing field will be using this type of equipment for bleaching with Liquid Chlorine.

The story of the world search for Bromine and of the Dupont Company's equipment of the seagoing ship "Ethyl" with chlorination apparatus, is not complete without mention of the fact that she went to sea supplied with Liquid Chlorine in ton containers.

An organization that is conspicuous for such broad and practical vision is of service, first to its customers, and second to the consumer at large. The development of this convenient and economical Chlorine equipment has, in itself, made many new friends for the Mathieson Company; the problems of users of other industrial chemicals, in any field and in any quantity, are assured the same intelligent study and attention.

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250 PARK AVE. NEW YORK CITY
PHILADELPHIA CHICAGO PROVIDENCE CHARLOTTE

Deal Direct with the Manufacturer

Caustic Soda · Liquid Chlorine · Soda Ash · Bleaching Powder
Bicarbonate of Soda · Modified Virginia Soda
Anhydrous Ammonia · Aqua Ammonia

With the Publishers—

Living Up to Your Program

"I'm all tired out. I've had a rotten day today—didn't seem to accomplish anything." Haven't you often felt that way?

Some days you put forth a lot of effort and struggle and struggle. Yet the day ends with little headway made. And you are "all in." You haven't lived up to your program.

Then on other days you put in longer hours, but because things have been running smoothly, you feel little or no exhaustion because everything worked just as you planned it would work.

That this is a common occurrence is attested by Walter Dill Scott in his "Putting Men in the Mood to Work":

"A successful day is likely to be a restful one, an unsuccessful day an exhausting one."

Now there are unsuccessful days in textile mills, as elsewhere—days that "drag out" for everybody concerned; the work runs bad, machines give trouble, and the human tendency to combativeness aroused under such conditions crops out alike on foreman and worker.

COTTON often contains a good remedy for "that tired feeling" in textile mills.

Articles in COTTON tell how other operating executives have eliminated some of the annoyances and made the work easier. And as William Basset said recently in an article in The Forum: "Engineers realize that the easier the work the greater the production." The more readily you can live up to your program.

It must not be assumed that COTTON is going to set itself up as a cure-all for every slump in production. But many times that run-down condition which affects textile mills may be like anemia which affects children who grow too fast. Perhaps there is too great a demand upon the equipment. Maybe the supplies are not agreeing with the kind of product demanded by the trade. Perhaps the attitude of the new "boss" is not as as it should be under the circumstances.

COTTON has a tonic effect upon some superintendents, so they tell us. When they have been seeing black, it brings relief to pick up a current issue of the magazine and read how another mill which was afflicted the same way has been rid of its trouble.

Most of COTTON'S advertisers have been successful in prescribing treatment for mills that are physically "run down." They can distinguish symptoms and know from experience whether their brand of equipment or supplies will quickly bring about a condition leading to recovery.

A study of articles and advertisements in COTTON will indicate methods and materials to make work easier.

As Charles E. Carpenter pointed out in Administration: "Every human being, from the president down, contains just so much force . . . . What about saving the waste of the human force?"

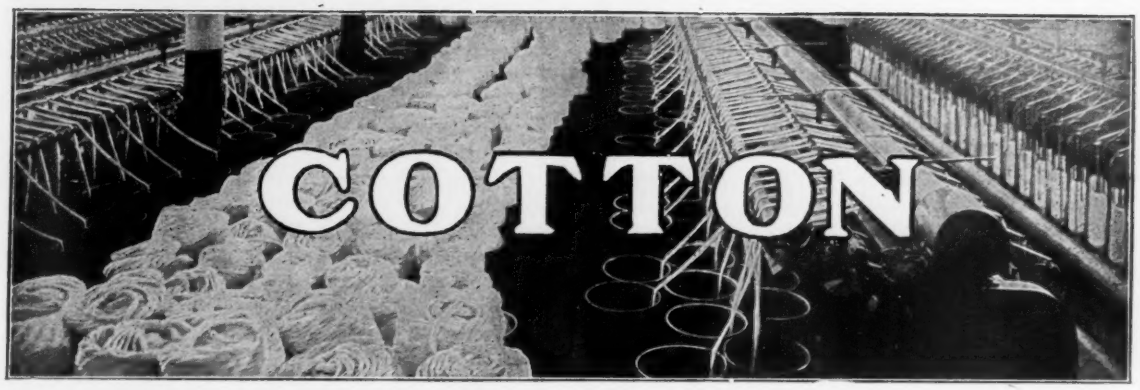
For that is the force that increases production. That is the force that allows your workers, as well as yourself, to live up to your program.

AMONG COTTON'S READERS

T. D. Pickell, Superintendent,
Cumberland Hosiery Mills,
Nashville, Tennessee.

"I heartily indorse the "Knitting Kinks" section you are conducting in your publication COTTON, and I read each article with intense interest. I have watched the "Knitting Kinks" department grow with interest, and I now turn to that section upon opening the magazine."

T. D. Pickell



June, Nineteen-Twenty-Five

Unifying the Railroads.

Nearly five years time has passed since Congress reversed the national policy towards the tendency of the railroads to become, in their fields, iron-clad monopolies. Though there was adopted a program which gave not only government approval but public stimulus to the combining of the railroads into a few monopolistic units, virtually nothing has resulted directly so far from the new policy. Such progress as has been made came about independently, even in despite of the program. This progress, while of itself alone considerable, is small in comparison to what was done during former periods of railway combining by Titans who—at least the last group of them—operated against stern governmental opposition.

The change of national policy towards railroad consolidation followed necessarily upon the tightening to the point of rigidity the policy of regulation and supervision. The Transportation Act of 1920 goes to the point of making the Government, in great degree, a partner of their owners in the management and operation of the railroads. It provides specificially for the protection of both the public's and owners' interests, which makes it necessary for the Government to exercise a supervisory control falling short only of actual operation of the properties.

This supervision is and can be only awkwardly performed so long as the railroads are cut up into hundreds of units, some strong, some weak, and paralleling each other. Any rate schedule may mean excesive earning for one road and bankruptcy for another. The much discussed guarantee and recapture clauses in the Transportation Act have proven to be only impracticable makeshifts. The strong roads would get along easily without the first and the second has been of no worthwhile help to the weak roads.

The problem would be amenable to easy solution were the weak roads blended with the strong. The Government's partnership relation to the roads possibly could be exercised with fair success if only, say, twenty companies had to be dealt with instead of the approximately 1,500 as at present.

Congress provided for steps being taken to bring about consolidations that would achieve that desire. The Interstate Commerce Commission was to make a "comprehensive plan" for the unification of the railroads on a national scale. Since then much has been done towards formulating such a plan—and the more that has been done the more apparent has it become that the achievement can not be attained that way; that is, unless the Government "goes the limit" and takes over the railroads. There evidently is no practical way by which the railroads can be forced to yield to a straightjacket plan of unification. And such a plan puts many barriers in the way of such unification coming about in a natural evolutionary manner. The move towards idealistic unification really has delayed the process.

Most of the unification that has been achieved contradicts nearly all idealistic conceptions and purely theoretical groupings. Nearly 12,000 miles of road changed hands in the direction of unification last year. Projects now pending, like that of the Van Sweringen brothers of Cleveland whereby a big new system would be brought into being in the East, involve the unification of as much additional road. These achievements have come through round-about ways: for the Transportation Act, if literally applied, would hold off all consolidating until a plan is formulated and then would limit it to the pre-conceived plan. Most of the unifying has been via "mergers" which are authorized by the Act.

It is probable that reasonable unification would come about ultimately under present laws as now construed. But a clarification of the laws would expedite the process. Most students of the subject are now urging that all preconceived plan schemes be abandoned; that the railroads be allowed to combine voluntarily under the general supervision of the Interstate Commerce Commission which would judge each venture on the basis of the public interest. Others, however, believe that some kind of formula should be applied, and some advocate the application of some measure of compulsion.

Both operated in Great Britain where consolidation was brought about in a short time. But the situation there differs much from that in this country. We already have railway systems practically as large as the four British ones combined. We have more than 250,000 miles of railway against Great Britain's less than 20,000 miles.

In this country, around 85 per cent of steam railways traffic is now handled exclusively by twenty-two large systems. Half of the traffic now passes over only about one-tenth of our mileage.

The great problem is to save this other mileage, or that

part of it which is not self-sustaining and yet is necessary to the progress and prosperity of communities served by it. Some experts say that much of it can not be saved unless taken over by the Government or linked with stronger lines. The situation of much of it is being made more and more precarious by motor-truck competition.

Unless the present national policy undergoes radical change, which is unlikely, the next few years is going to see gigantic developments in the direction of unification of the railroads. On the shaping of these developments will depend the issue of continued private ownership and management as against government ownership and operation. The latter is not apt to come about through public acceptance of it as a theory, but it can come about through necessity, which might be produced by unskillful handling of consolidation and other moves looking towards continued private ownership.

Considered from the far-future standpoint, the railroad question probably will be the biggest and most important before the next Congress.

Congress Versus the President.

Recently there was argued in the United States Supreme Court the probably most significant Constitutional case of recent times. Like most cases that have brought about epochal precedents, this one revolves around a primarily unimportant dispute. It seems that President Wilson removed from office a Western postmaster who countered with a suit against the Government for the salary he would have received had he been permitted to serve out his term. His claim was that the removal was illegal for the reason that it had been made without "the advice and consent of the Senate."

The case was viewed at first as one of the numerous ones ranked as freaks. Later it was discovered that it involves a far-reaching question. This, succintly, is whether Congress or the President shall be uppermost in controlling the administrative affairs of the Federal Government. If the law under which the claim is made is held to be Constitutional, Congress may set up—as it did recently in a notable instance—administrative agencies that will be beyond the control of and even superior in their realms to the President. This would mean that Congress could tie the President's hands in virtually any matter of administration not given exclusively to the President by the Constitution. It did this when setting up the General Accounting Office under a Comptroller General made unremovable except by Congress itself and also, apparently, made independent even of the courts. Since he has auditing control of all payments from the Treasury, the power thus granted is immense. The present Comptroller General already has ignored the Executive branch of the Government, and in some degree the courts, in ruling against the legality of many expenditures. It is his office, with the big precedent represented by its establishment under the conditions adhering to it, which is the real issue in the case brought by the disgruntled postmaster. This office was set up largely because of the reckless and careless methods that came into use, mostly through necessity, in spending the taxpayers' money during the war. Congress reached the conclusion that all expenditures should be put under the supervision of an authority as nearly as possible free from all influences. They thus made the comptroller general independent by decreeing that he shall serve for a term of fifteen years and be subject to removal only for proved offense of serious kind adjudged by Congress itself.

If the precedent holds, Congress can set up other like officials. It even might put members of the Cabinet beyond the control of the President.

While public opinion is not inclined to side with the legislative body in any controversy with the executive branch of the Government, there is much to be said on behalf of the Congressional contention in this instance. The Federal Government probably has grown beyond the power of any individual to give close supervision to its manifold executive operations. More checks than hitherto provided no doubt are needed.

Moreover, with all of its faults, Congress is the "popular" branch of the Government; that is, the public can "get at" one-half of it every two years, and, if it wills to, can express itself more clearly through it than through either of the other departments of Government.

This Question Should Be Cleared Up.

Although many more than one-fourth of the States have refused to accept the so-called child labor amendment to the Federal Constitution, the all but unanimous rejection of the proposal still is in many ways figurative only. No proclamation, as would have been put forward promptly had three-fourths of the States accepted the amendment, has come forth and closed the record. Evidently the State Department has no intention of putting one forth. Its duty in the premises is not made clear by prevailing laws or former practice. Many advocates of the amendment claim that it can not be rejected because of the fact that the statutes, as they stand, make no provision for closing the record except when ratification occurs. Since, by such precedent as exists, any State may change its position so long as the record is open, these advocates declare that the "fight" for ratification will go on until won. Despite the fact that only three or four States have accepted the amendment—and practically each of them reluctantly—and most of the others have rejected it by overwhelming votes of disapproval, such a continued fight would not be entirely hopeless. Opponents of such ventures are prone to lose interest after winning what seems to be a decisive victory. Legislative bodies frequently yield to uncountered pestering as the only way to get rid of the pesterers. As the situation stands, the agitators who would turn the children of the country over to the bureaucrats of Washington may be free to pester the legislatures indefinitely.

Congress can change the situation by directing that the Secretary of State proclaim the rejection of a proposed amendment just as that official now is directed to proclaim the acceptance of one. That would mean the closing of the record on this one for probably all time. Congress undoubtedly is now convinced that the country doesn't want the amendment; and it should take only a little prodding to induce that body to amplify present statutes in a direction of common sense and fairness.

"It is the biggest mistake in the world to think that you are working for someone else. Try and realize that someone else is paying you for working for yourself."

Scientific Trends with a Textile Slant

If every mill owner were able to house his work in the most ideal fashion he would be a cave-dweller or a builder of chateaux. Unfortunately there isn't enough money in the whole industry to make it possible.

Within certain limits absolutely permanent construction must always be the best. Yet many cases arise where small items of construction do not require and, in fact, would be more adaptable to the job if they were less permanent structures. Cost has rather less to do with the matter than might at first be supposed to be the case. Especially construction cost.

Next in importance to the economic influences, over which he has little control, the man who holds the destinies of mill property in his hands must take account of the peculiarities of the materials which make up his properties and machinery.

This is especially true in providing for new construction and replacements. It is just as true in taking account of the value and utility of what he has, already. In close seasons a very slight percentage in the cost figure often makes a bid effective or fatal to the taking of new business. It is important, then, to know to just what extent old equipment can be depended upon. It is fully as important to be able, at all periods of the management, to look into the future and say when this or that improvement must be made. Plainly, such information will make for intelligent revision of any such plans as may be afoot and give the manager a firmer background upon which to sketch his operations.

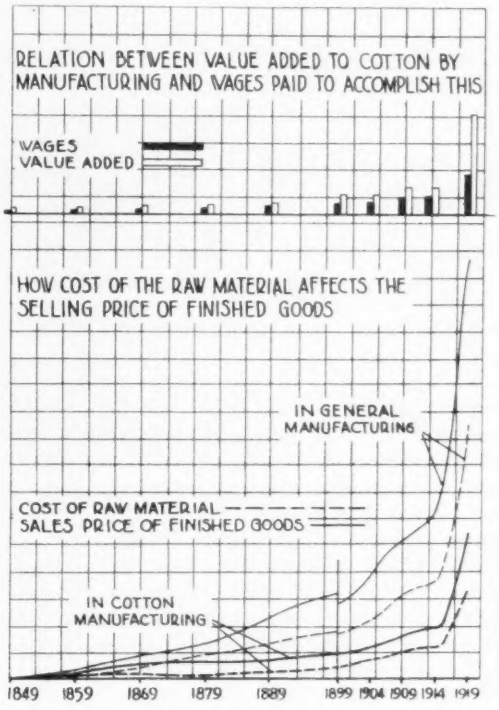
Incidentally, it is just such method of analysis by means of which a competent engineer is able to design a satisfactory structure to meet any specifications laid before it. Engineering principles and technique in management, more exact information about each phase of the job, make for better, more economical and more smoothly-running management.

Maintenance cost is a very influential item in it. Heating is an expensive matter over years of time, and although heating is not the chief worry of southern manufacturers it is an extremely important matter to quality control and production to maintain some degree of heat in the cold months. The cheaper this can be done, the better. For another thing, the building of more solid construction nearly always outwears the light-weight structure in resistance of the storm element of weather. That is a very serious factor in any part of the United States.

Location of a factory may have a decided influence upon the choice of materials to be used in its construction. Obviously, to haul brick and tile up a mountain-side already heavily timbered with good oak would call for considerable argument in its favor in order to outbalance the relative costs per yard of the two materials.

Cotton Manufacturing Money.

The cotton industry of America has reason to be proud of two significant things that may be lost sight of to the average man. The first of these is the place it occupies in relation to manufacturing in general by virtue of its own efficient operation. In all manufacturing a certain consistent relation exists between cost of the raw materials and price of the finished article. Yet a great many lines of manufacturing show inconsistencies in this ratio that can be explained in no other way than by exorbitant profits or inefficient management. Competition alone is never the influential factor here. Throughout the years of its recorded history a very consistent ratio has existed in cotton manufacturing between these two figures. This ratio is well in keeping with the ratio for general manu-


RELATION BETWEEN VALUE ADDED TO COTTON BY MANUFACTURING AND WAGES PAID TO ACCOMPLISH THIS
WAGES
VALUE ADDED
HOW COST OF THE RAW MATERIAL AFFECTS THE SELLING PRICE OF FINISHED GOODS
IN GENERAL MANUFACTURING
COST OF RAW MATERIAL
SALES PRICE OF FINISHED GOODS
IN COTTON MANUFACTURING
1849 1859 1869 1879 1889 1899 1904 1909 1914 1919

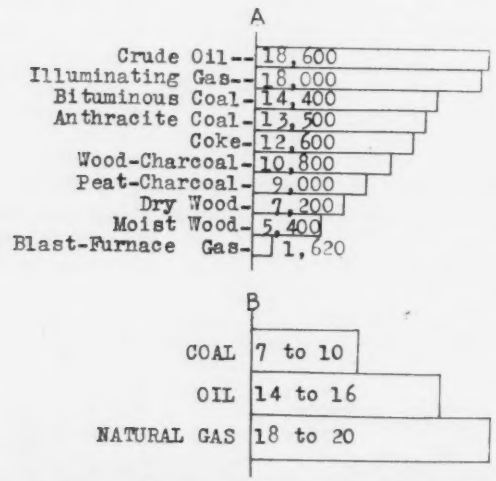
facturing and is even more truly consistent with its own status.

To the individual, perhaps a more interesting figure is the one that proves that throughout all this period approximately one-half of all the value which manufacturing processes added to the raw material has been returned to the men who made this additional value possible. This is profit-sharing, indeed. In many years, in fact, in the majority of them, the figure has been somewhat in excess of this percentage.

The price of finished commodities and the wage paid for their production are rather enormous factors in building up and stabilizing any industry.

Fuel.

The problem of choosing a fuel that shall satisfy the regular demands of production must depend, first of all, upon the nature of work it has to do. The chief difference



A. Relative heating value, in standard heat units, of the more common types of fuel.

B. Heating efficiency, per relative weight, of the three principal industrial fuels.

between requirements will be encountered in whether its function is one of throwing out heat over a wide radius or in use as a means of steam production.

Most textile requirements are largely of this latter type, hence interest in their heat-producing power as boiler heat makers. We are also concerned with the proportional *weight* of the principal fuels required for such work. Most fuel has to be shipped to us.

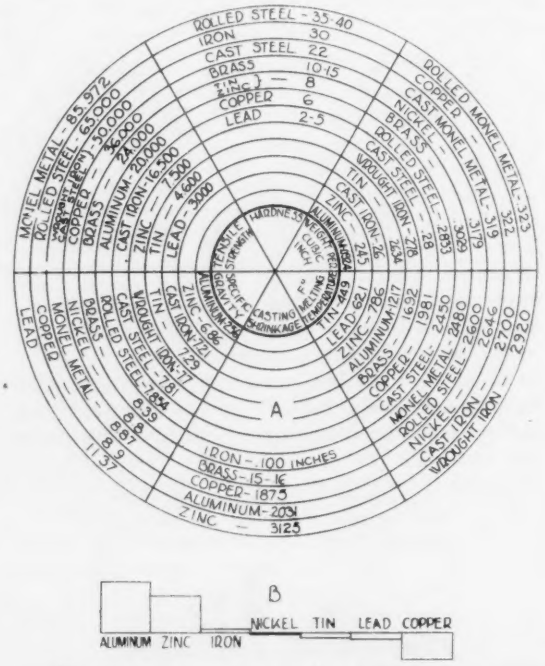
Sometimes a situation arises where freight rates and fuel prices strike such a balance that a cheap cost coal, shipped a relatively long distance is most economical in a monetary way for a particular plant. The three factors of freight, cost per ton and heating value (in their special type of usefulness) determine the choice. No one factor makes a fuel "cheap." From a national efficiency point of view long distance shipments are bad, but industrial conditions can admit of them.

Nevertheless, it would be a good idea for a far-sighted executive to have constantly in mind that emergencies arise in the transportation world and he should have first hand information constantly before him as to what *other possible combinations* of these three important factors are available to him.

The Problem of Efficient Machinery.

The design, maintenance or basis of purchasing reliable machinery depends upon knowledge of what it is to be called upon to do. This must be followed by choice of the materials which will do it.

A machine has so many demands made upon it, in modern production work, that neglect of any one may seriously shorten the life of the whole machine and change it from being an investment to an expense. Matters of strength,



A. The order of useful properties of the more common metals used commercially. Note that a metal that ranks first in one desirable property frequently takes a lower place in another property. Selection must come through an average of desirable qualities.

B. The order of "solution tension" or protection power of metals. All metals are subject to an electric action causing them to dissolve or give out. From this table the least likely of any two in a combination may be found. Thus, zinc protects iron and we have the well-known commercial use of this fact in galvanized articles. There are many possible useful applications of this property of metals, all dependent upon their relative order in the scale given.

resistance to corrosion, and ability to stand continual wear may be of equal importance only with considerations of weight of parts and the ability to produce them by some such simple method as casting them.

Prompt and accurate judgment of the suitability of a metal for the demand to be made upon it depends, first, upon having before one the scale of relative values in these various lines. Then the importance of each of these qualities to all the others is a matter of common sense.

"Budget Control" is a timely booklet for executives just published by Ernst & Ernst. It is written by A. C. Ernst, and represents the successful and best experience of modern management in operating a business budget. It shows how every detail of buying, production, financing and selling can be planned in advance and then checked with and regulated by actual operations to assure profit and prevent loss. Executives may secure the book upon request.

Georgia Mill Men Stress Cooperation

Within recent years the conventions of certain trade associations have demonstrated forcibly an active and effective organization working throughout the entire year. That the Cotton Manufacturers' Association of Georgia is without question included in this list was definitely proven by the annual convention, held at the Atlanta-Biltmore Hotel, Atlanta, Ga., on May 11th and 12th. The spirit of the sessions reflected a thorough-going, working association organization.

The convention opened informally on Monday evening, May 11th, for the purpose of discussing and reducing to concrete form for presentation at the Tuesday session certain matters of vital importance to the textile industry. The results of this discussion meeting, which was unusually well attended, took the form of recommendations to the resolutions committee.

At 10:00 o'clock on Tuesday morning, May 12th, the convention was formally opened by President George S. Harris. J. Wilkes Collins, pastor of the St. Paul Methodist Church, Atlanta, was called upon for the invocation, following which Mayor Walter A. Sims, of Atlanta, cordially welcomed the visitors to the city. The response was made by J. H. Mayes, who is Mayor of Fitzgerald, Ga., as well as a cotton mill man.

Following the appointment of committees, President Harris, who is president and manager of the Exposition Cotton Mills, Atlanta, presented the

Annual Address of the President.

This was regarded as a most forceful exposition of conditions of the industry, and an appeal for cooperation, and contained many suggestions regarded as highly worthy of thought. Mr. Harris said in part:

"Just a year ago, you honored me with the election to the presidency of the Cotton Manufacturers' Association of my native state, and from that moment, I have felt a peculiar responsibility for the welfare of every cotton mill in this state. Georgia means more to me today than ever before. I am proud of our state, and proud of ours, the first industry of the state. This southeastern section of our country, in my opinion, is destined to show a growth unequalled by any other group of states, and Georgia is geographically located to enjoy the full benefit of this development. In my opinion, the next twenty years will see many changes, both industrially and agriculturally, and whether or not our mills of today suffer or prosper with this great development depends directly on the breadth of vision, and the foresight of those charged with the management of these mills.

"When I started as a hopper boy in a little yarn mill at Cedartown only a few years ago, there were less than five million spindles in the entire South. I have seen this figure grow to more than seventeen million in but a few years. This presents the spectacle today of a man in boy's clothing, and we have clearly reached a stage in our growth where we should carefully check our present status and attempt to visualize our future. As our association is at this time celebrating its twenty-fifth birthday, there are two questions we should ask of ourselves, and attempt to find the answers. First, how far have we traveled, and, second, where are we going from here? By this I mean what have we accomplished in the past and in what way can we make our association of more value in the future. We must think in terms of the association, and not as individuals. Our Association activities have been confined to comparatively very narrow limits, although capable of being expanded to reach matters of mutual interest in many directions. It is not sufficient that we should be interested only in constructive legislation, and meeting once a year for exchange of ideas only. The time has arrived when we should thoroughly harness the machinery of this Association, and put it to work. The time is here when we should see through the eyes of this association the needs of our neighbor, and see him as a fellow-sufferer instead of a competitor and an enemy. We owe this, my friends, to those people at work in our mills and to those who have invested their capital in our corporations. The time has passed when we can pay workers a scale of wages less than other industries, as well as pass dividends. Unless we can interest capital with good returns, and at the same time pay our workers rates of pay fully equal to other high-class industries, we cannot justify our existence as managers.

George S. Harris, Re-elected President.

"The mills of the South have their state organizations, all bound together by the American association, and I have during the past several years attended many of these asso-

"Unless we can interest capital with good returns, and at the same time pay our workers rates of pay fully equal to other high-class industries, we cannot justify our existence as managers."—President George S. Harris.

ciation meetings, but, frankly, I see very little real value in any of them as compared to what could be accomplished if they could be properly harnessed. There was a time when a very large percentage of our mills were controlled by either commission houses or banks. The war came along, and pitched into the laps of these mills unheard of profits, and made them independent. With the return to normal conditions, this independency is fast fading away, and the necessity of liquidating stocks by a few mills has, at times, lately played havoc with an otherwise nervous goods market. We think we can operate our business entirely independent, and with no regard for others, but in my opinion, this thought has cost our mills millions of dollars in absent profit margins. Your interest is parallel to that of your neighbor producing the same class of goods, and the interest of both of you is dependent on, and intermeshed with, the welfare of your customer.

"I think I have the distinction of having served you as your president through one of the most trying, if not the hardest year in your history, from the standpoint of profitable operation. In way of review, we at this time last year had facing us an impossible cotton situation. Two abnormally short crops had created a future market the equal of which we had never seen before. Old crop cotton varied during the Spring and early Summer from 25 cents to 35 cents, and bounced up and down like a rubber ball. Not only did new crop futures rule from three to six cents below May and July on the board, but by early May, cloth prices were based on the price of the new crop. You were asked to contract to deliver cloth in July, but the price of the goods demanded that you spin cotton that was yet in the boll. Even at the low prices, it was impossible to put over sizeable business, and after accumulating stocks, mills started a general curtailing movement, which reached its peak by early July. In fact, mills in our state curtailed production that had never before altered their running schedules.

"It appears that some mills were able to steer the ship over the dam, without shipping large quantities of water, but the general average was operating losses, and in some cases they were very heavy. In line with the time-honored custom of southern mills, nearly everybody continued to produce, holding goods in storage for a better and more profitable goods market until forced to stop, and finally sold these stocks at prices that would show a moderate profit with cost based on cotton at twenty-two cents or lower. Any mill that passed through this period without taking losses either did some very clever manipulating on the board, taking tremendous market risks, or else they produced their cloth from raw stock other than cotton. The clouds began to clear in September, but mill stocks were a weight on the market well into January. We have had a period of not more than three months out of the past twelve when it was possible to sell goods at a profit on current cotton.

"Furthermore, we have never felt so forcibly the fixed policy of hand-to-mouth buying that has become so very general during the past few years. No one seems to be willing to buy beyond 'next week' and when the sale for one bale is completed, shipment must be made yesterday. This new problem so general in cotton textiles, as well as in some other important commodities, concerns me as much as anything else, for I fear the disease is becoming chronic. We are called upon to finance cotton with cash payment the day it is shipped, yet we must not only carry our customers' stocks, but must ship only as he has immediate need, and then often give long datings at prices hardly over cost. I have tried hard to find the answer to all of this, and always come back to the lack of any semblance of cooperation or concerted effort to correct an evil that is choking the very life from some of our mills.

"It is true that some new conditions have developed in the consumption side of cotton textiles, and in fact, the figures indicate a material reduction in the per capita consumption of cotton cloth in this country. It has been estimated that consumption has decreased from 66 yards to 55 yards. If this is true, it is equivalent to the production of 16⅔ per cent of our spindles—startling if true. This appears to be due, in a large way, to the change in styles of women's clothing, which today contain among some classes no cotton, and in others, a much reduced quantity, and a reduction in the total buying due largely to the enormous amount of money passing from pay checks into automobiles in an increasing quantity each year.

"There is no indication in the data available that there has been an over-expansion in cotton textiles either within the United States or in the industry as a whole, yet you are not able to merchandise your product continuously in pre-war volume at the advances made necessary by the average post-war cost of cotton. There is very clear evi dence that some parts of the world's cotton mill equipment must remain idle or else manufacture goods from artificial silk or other fibers until such time when the production of cotton and consumption of goods can be brought back to the requirements of the world's spindles.

"For some ten or fifteen years before the European war, the world was increasing its cotton spinning equipment with great rapidity, and during these years we brought into commission throughout the southern states millions of new spindles, a very large part of which were started on the same general lines of fabrics. Outside of the United States, and the Far East, there has been practically no addition made to the world's spinning equipment since 1913. The actual increase in the world's cotton spinning spindles, including this country, between 1913 and 1924, was nine per cent, while the world population increased in almost the same ratio. In this country, during the war and post-war years, our cotton spinning industry has increased by about eighteen per cent, while the increase in population has been sixteen per cent. Meanwhile, there has been a reduction in the average running time of about eight per cent and a very considerable reduction in per capita consumption of cotton cloth. The increase in the world spinning capacity outside of the United States since 1913 is confined almost entirely to the addition of 7,000,000 spindles in the Far East, bringing China and Japan now to about 16,000,000 spindles, or very nearly equal to the capacity of our southern states. On the other hand, the working hours generally throughout Europe have been reduced by law to an extent fully equalling the total additions in the Orient.

"I mention these facts and figures taken partly from recent publications of the National Bank of Commerce, to indicate that from the standpoint of capacity, the industry is sound, but readjustments are necessary before our mills will be able continuously to merchandise our full production on a profitable basis. It is going to be necessary to watch carefully market demands and adjust production accordingly. So long as mills continue to stock goods in an-

ticipation of market requirements, you may expect a continuation of this hand-to-mouth buying policy, and a heavy goods market with very close operating margins, if not losses.

"We are quite certain that the total mill stocks are low today, as compared with six months ago, but we have no means of knowing what lines are stocked. With no cooperation as at present, the manager of Mill A, finding no sale for its product, and reluctant to reduce running schedule in advance of other mills, must either stock goods in anticipation of market requirements, or change his looms to some fabric he thinks is safer to stock than his own. Same old story of a jackass trying to reach the other pasture, with the result that the Mill A man finds his mill out of balance with a cost higher than his competitor, and by the time he can bring in his new production, it goes to warehouse along with the goods he had been making, and for which he is better equipped to produce. Until we get by this readjustment period, we should be more careful with reference to 'speculative production,' and get away from the ideas of the man who wants to kill his competitor.

"We find today two schools of thought, and I will attempt to picture the two opposing forces. One side is illustrated in a conversation I recently had in New York with an official of a large mill. In reply to my question as to how he was progressing, he stated about as follows: 'I am running full day and night, and selling my production at cost or lower.' The natural question was why this large production. To this he replied, 'We are going to kill our competitor. We are going to either force him out of business, or drive him into other lines. This may require five or six years, but at the end of this time, we will be there with the trade, but without competition.'

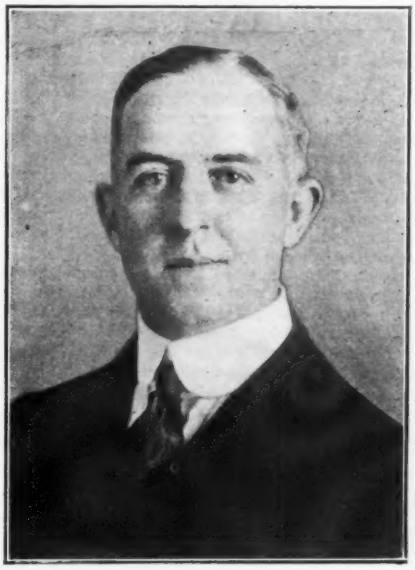
"Let us assume for a moment that this man is able to fully put across this crude policy, and see what happens. He is continually making a market under his cost, and, we will assume, under the cost of his competitor. The result is, in time, that his competitor is forced into liquidation, but the mill stands. The company is reorganized, and my friend finds himself facing the same competition, but capitalized on a much lower basis, resulting in a competitor much more difficult to handle than formerly. He probably has another five or six years to kill his new competitor, and the chances are this time we have another funeral, but my wise friend will be the corpse. This man crudely expressed the policy of a great many mills today.

"The other side of this picture will show theoretically every mill radiating from a central point, which we will call the American Textile Institute. At this central point we will find the greatest outstanding American manufacturer whose personal interest is divorced entirely from any mill or group of mills. With this man is one of the greatest of American statisticians, surrounded by the necessary force to gather and disseminate complete statistics covering stocks, past sales, unfilled orders and any data required to enable American cotton manufacturers to intelligently shape their policy at all times.

"From this central point will radiate all of the American mills, irrespective of section, grouped according to various classes of constructions that individual mills are equipped and balanced to produce. With every mill reporting fully to the Institute, and receiving in return full and complete data, we will have an industry pitched on broad and sound principles. This naturally is predicated upon the complete elimination of the ignorance, jealousy, and lack of confidence that appear to thoroughly permeate the industry as a whole today.

"Such a plan, based safely within existing laws, if endorsed and supported one hundred per cent, could and would serve the industry in various ways, accomplishing results that it is impossible for individual mills or groups of mills to accomplish, as organized at present. This may sound so bold as to be ridiculous, but bigger things than this have been accomplished once men get the necessary inspiration. I submit these two pictures to the consideration of American cotton manufacturers for what they may be worth.

"We have had a very interesting year from the stand-



W. M. McLaurine, Secretary.

point of association activities. Among the important matters handled, I would mention in their calendar order: power rate adjustment; compensation insurance rate adjustment; traffic department matters of importance; cotton rules; legislation." On each of these points Mr. Harris related some of the association activity, with the result in each case.

The next speaker was George L. Fossick, president of Fossick's Statistical Bureau, Inc., Memphis, Tenn., who discussed "Cotton Statistics."

After Mr. Fossick's address, Mr. Harris presented several distinguished visitors, the first being Robert Gregg, president of the Georgia Manufacturers' Assocaition, who brought greetings from that organization. E. C. Dwelle, of Charlotte, president of the Cotton Manufacturers' Association of North Carolina, and A. W. McLellan, of New Orleans, president of the Cotton Manufacturers' Association of Louisiana, were next presented. William J. Vereen, president of the American Cotton Manufacturers' Association was then presented, and pledged the cooperation of his organization in all efforts during the coming year.

J. E. Conwell, president of the Georgia Cooperative Marketing Association, bespoke the assistance of the manufacturers in the work of this body. Mr. Powell, of the

American Mutual Liability Insurance Co., and Mr. Jones, of the American Casualty Company, discussed compensation insurance, and Norman E. Elsas, vice-president, Fulton Bag & Cotton Mills, spoke briefly on labor turnover. C. E. Cotterill, counsel for the Southern Traffic League, discussed railroad conditions.

At the end of the morning session an enjoyable luncheon was served in the grill room of the hotel.

The afternoon had been set aside for a golf tournament, but this was called off due to inclement weather, and while a few brave souls marched over the links, the majority of the delegates spent the afternoon in conversation and other forms of diversion.

At 7 o'clock on Tuesday evening, business was resumed at the third session of the convention, when the report of the resolutions committee, Lee M. Jordan, chairman, was read. The first resolution, pertaining to child labor legislation, was:

Resolved, That we, the Cotton Manufacturers' Asociation of Georgia, in body assembled this the 12th day of May, 1925, do hereby and herewith go on record as favoring a Child Labor Law for Georgia which shall prohibit the employment of children under 14 years of age from work in any industrial plants under any circumstances whatsoever; that shall provide that the ages and physical fitness of children between the ages of fourteen and sixteen who are permitted to work shall be established by a proper method of certification, such method of certification to be provided for by act of the legislature.

Resolved further, That we favor the prevention by law of minors below sixteen years of age working in any industry between the hours of 7 P.M and 6 A.M., and the ages and physical fitness of all those between the ages of 16 and 18 who work shall be certified by the same method of certification as indicated above.

Another resolution approving the new Southern Mill Rules governing the purchase and sale of cotton, was adopted.

A resolution to make the meetings of the Association semi-annual instead of annual, meeting in the Spring and Fall, was also adopted.

Other resolutions, referring to compensation insurance, taxation, scholarships at the technological school, the meetings of the operating executives, cotton reports, etc., were adopted.

The election of officers resulted in the re-election of all officers who have served during the past year, including the board of directors. The officers are: George S. Harris, president; S. Y. Austin, vice-president; Wm. M. McLaurine, secretary; T. J. Callaway, treasurer; C. W. Chears, traffic manager.

Following this business session, the usual banquet was served, except that it was "Unusual," in that there were no speeches, and several unique features of entertainment were offered. The banquet concluded the convention.

The Barrett Company, 40 Rector Street, New York City, have begun the issuance of a series of informative reference books for men interested in building. The first of these, recently published, deals with built-up roof construction for flat roof decks. There will be four further books relating to other phases of roofing practice.

The physical assets of the Gilliam Manufacturing Co., have been purchased by the Timken Roller Bearing Co., Canton, Ohio. The production of both Timken bearings and Gilliam bearings will be continued in their respective plants.

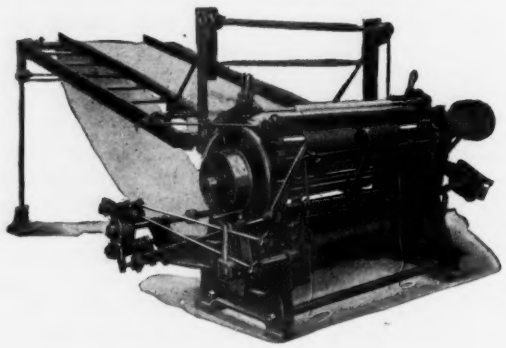
New Trimming and Roll-Winding Machine.

Manufacturers of coated fabrics such as shade cloth, Holland cloth, tracing cloth, oilcloth, artificial leather and a host of others, including, of course, fabrics for book covers are up against certain difficulties in winding these fabrics into really good firm rolls for shipping to customers.

The average roll arrives at the customer's plant in more or less untidy condition, no matter what care might have been used in the packing of it. Everybody knows the reason for this is that in the winding of these rolls it was difficult to so control the fabric as to make a good firm roll, and at the same time make a roll with the selvage edges running up straight and even on the ends. A roll-winding method for correcting these difficulties in a practical way is something that the average manufacturer will welcome.

It is claimed by Cameron Machine Company, of Brooklyn, New York, who build the machine shown in the illustration, that their recently perfected machine provides a quick and inexpensive means of doing this work and at the same time inspecting the fabric for defects.

The machine, briefly described, consists of apparatus for unwinding the mill roll under tension, properly steering and guiding the fabric over an inspection table, automatically, trimming the edges if the trimming operation is desired, and then winding the web into good firm rolls—all at one operation and at high speed.



This machine also provides an auxiliary winding device which will wind up into tidy rolls such material as might be rejected and cut out by the inspector, so that this rejected material is in convenient shape for future handling or sale as seconds.

The machine is also equipped with a measuring attachment which records the yardage so that the one operator has under his control practically everything necessary to convert ordinary mill rolls of all kinds of coated fabrics into very presentable shipping rolls, and doing so at a higher speed than the more or less unsatisfactory way of turning out rolls by the old method. It is well known that the customer likes good tidy rolls which carry well in shipping.

It is also important to note that the builders of the machine claim that the guiding of the web, as it passes through the machine, is entirely automatic, so that the operator does not have to give constant vigilance to the forming of a roll of fabric with smooth, even ends.

Southern Textile Association—Asheville—June 19-20.

What Other Men Manage With

BY R. A. SONIAMAN.

Management.

No discussion on what other men manage with would be complete if it did not take up in more or less detail that momentous subject—management. And although the ramifications of management are as many, seemingly, as automobiles on a sunny summer's day, the managerial problem can, roughly, be dissected into three main divisions:

(a) administrative; (b) manufacturing; (c) mechanical.

There is much, however, in each of these three sections of management which overlaps something in both of the others; therefore, the writer offers no apology if he is found inadvertently wandering into the byways of the one while in the midst of a discussion of another of these three partitions of management. The main thing is to bring out as many points of value as may be possible, giving due regard to the inevitable limitations always existent in a printed treatment of such a far-spreading topic.

The principle issue in every scheme of management is this: is the system adopted sufficiently comprehensive and flexible enough so that the utmost in efficiency is attainable with the least expenditure of effort, time, and money?

Now, since cotton is the chief raw material that management has to deal with in a cotton yarn mill, it behooves every visitor to another mill, to find out how this other plant arranges for the purchase of this important commodity. Who does the buying? How does this person know what cottons to purchase? What qualifications make him an authority in the purchasing of the cotton? Then, again, after the cotton is bought, how is the cotton tested? Who gets the report of the results of such tests, and are the records filed in the office so as to be easily accessible for the guidance of future cotton buying?

Next to cotton, the main purchasing consists of the supplies that are necessary to keep the machinery properly manipulating the cotton. Who buys the supplies? Are there any tests of the different supplies? For example, in the purchase of the different oils, is there a chemical test made, and an analytic report placed on file in the office? Has this method proved of value in the purchasing of other supplies?

It might be well to inquire as to whether the testing of supplies will affect the cost of overhead. The writer, from experience in both large and small plants, can say that the cost of overhead in respect to the matter of watching the quantity and quality of cotton and supplies may be kept relatively low with a little thought and system.

In a small establishment, the superintendent may attend to the buying of the cotton and the supplies; but in a large plant, a special department is usually set aside in the office for this purpose. In very large plants, this purchasing department is often subdivided again, one section looking after the purchasing of cotton only, the other taking care of the supplies.

In his many visits to other mills, the writer was struck with the variation in the size of the clerical forces of the different concerns. Here, then, is a fertile field for investigation. How many clerks are there in the mill you are now looking over? What is the idea of just that number? The writer has found that in some plants the clerical payroll is quite a drain on the financial vitals of these concerns. A good deal of the trouble in these places is due to the needless duplication of effort in the duties of the clerks. This situation is particularly true where the corporations have grown rapidly and have not been able to keep apace with the problem of properly laying out the clerical work.

Other mills have so meagre an office force that only the

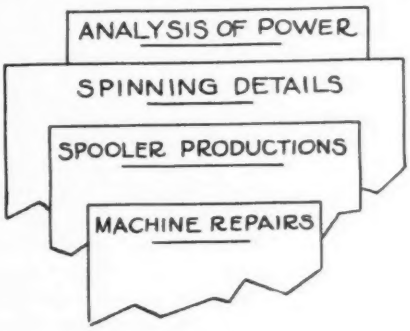


FIG. 1

barest semblance of keeping abreast of existing conditions can be had. This extreme is bad also, because well designed and accurate reports, Fig. 1, are to the management of a mill what a good clinical thermometer is to a physician: a true register of the internal state of affairs. Obviously, every alert mill manager should determine with the help of his mill and office executives just what matter is to be embodied in reports and then all should be watchful that the results thus obtained are not rehashed again in some other report.

Another thread of the administrative department of management is that of devising the method of payment. Is the entire plant on standing pay? Or is there, as the writer has so often found to be the case, a combination of both time and piece rates? Some workers on the one, and others on the other form of pay. What advantages does your friend claim for piece work wages?

"I can best answer that," he will most likely say, "by pointing out the disadvantage of the time payment on those jobs where large numbers of female workers are employed: fly frames, spoolers, winders, reelers, and so on. Time payment on these operations means a very low percentage of efficiency always. A comparison of the productions obtained by the same worker under the two systems of payment will prove this assertion. The advantage will every time be with the piece rate; therefore, I advocate installing these wherever it is possible to do so." Does this agree with your own experience?

Then may be asked: who sets the piece rates? Because it touches on a matter equally important to both workers and management, this quiz is a most interesting one. Is there a specially trained office man who fully understands every phase of the proposition and is thoroughly capable of handling it? Or is it merely turned over to the first person at hand with the expectation that from the more or less reliable statistics which he may accumulate an adequate

piece rate will be worked up?

In this matter of piece work, who, it may be asked, sets the efficiency that it is expected the worker will be able to maintain hour after hour, and day after day? And how? And what is this efficiency based on? For it should be thoroughly understood that with the making of piece rates, no matter what section of the mill or process, there must be a certain margin allowed between the production calculated and the production actually possible of attainment by the average worker. Deducting this margin from the 100 per cent calculated production leaves the efficiency upon which the piece rate can best be established.

What arrangements are there for checking up the production of each worker at a piecework process? Does the firm expect a fair day's work for a fair day's wage? Right here, then, a question shows itself. What is the earning capacity of the workers in general? Every worker well up to the standard expected, or is there a heterogeneity of efficiency percentages, ranging from 50 to 95?

The writer earnestly believes it the duty of the mill management to thoroughly imbue the minds of its overseers that every worker on a piecework process should be coached to attain something like the maximum efficiency. There is much to be gained by such a step: first, it means that the firm is getting the maximum use of the machinery; secondly, that this maximum production is of the best quality because it is a somewhat general characteristic of top notch piece workers that they produce an excellent product. The long service which they usually have to their credit has given them the knack of efficient working, both as to quality as well as quantity, which becomes second nature.

While at the wage question, just what is the wage policy of the firm throughout its plant? To give a wage as good

YARN SCHEDULE
------19---

YARN NO.	PLY	TWIST	POUNDS REQUIRED
53	3	Left	410
65	2	Right	210
75	4	Right	550

FIG. 2

as, a little better, or a little less, than other mills of a similar nature in the neighborhood? This is a matter which should receive careful consideration and should be thoroughly gone into by a visiting executive. During the world war, deplorable results often came from a policy of following the wage increases given by other concerns by firms which, for the good of their own sakes, should have been the pioneers in wage advancement. How does your fellow manager stand in regard to this subject?

Office laid out schedules, Fig. 2, form a component part of every up-to-date plant. How about the place you are looking over? How long, if they have any, do their schedules run? And what are they based on? And who works them up? It is surprising how thoroughly disorganized a mill can become, particularly a large one, when there is no effort made to put a schedule into effect and to see that it is carried out as effectively as possible.

Every department's production, after due allowances, should dove-tail with that of every other one. But how seldom is this the case, especially when no study is made of the productive capacities of each process throughout the concern. Too often a bad matter is made worse, by stopping a room on account of overproduction, running a section in another department overtime to catch up with a previous process or to keep supplied a subsequent process, until finally, chaos reigns supreme. Is there a production manager in the mill you are visiting? A capable man who devotes enough of his time to productions so that there is less likelihood of the mess just cited? And is he given authority to ask for and demand fulfillment of such changes in the schedule as may be required to keep every department on full time?

It might next be well to ask where the finished product is exhibited for sale? And who keeps a vigilant eye over the exhibited goods to see that they are displayed to the best of advantage? Many a good product is so poorly arranged or so badly soiled in handling by careless salespeople that customers can hardly be censured if their first impression—often a lasting one—is an adverse one to the goods. And it may be quite possible that a competitor's goods displayed in the same store may be very tastily and tidily shown. Here is a pointer well worth following up, particularly if the sales from certain quarters are not as great as may be expected.

At this juncture, it would also be fitting to speak about another matter that may make or mar a product's selling possibilities. And this is the matter of putting out thoroughly inspected goods. They should appear flawless in the eyes of the customer. The writer some years ago looked over the exhibit of a nationally known concern. The goods on display occupied the whole of an extensive show window of a large department store in a big eastern city. It was only a moment before he noticed quite a few very bad manufacturing faults as well as poor dyeing. These defects were so conspicuous that they could hardly fail to be perceived by the purchasers.

It is well, therefore, when visiting another mill to find out what system of inspection there is to prevent the foregoing unfortunate oversight; what sort of check there is to insure, first, that the defective pieces never appear in the displays of the goods; second, that the possibility of the manufacturing defects reaching the final processes of the goods be reduced to an absolute minimum. It will pay any progressive concern to spend a larger sum of money on inspection until by internal drives it has brought these obnoxious faults down to the so-called irreducible minimum. What does your friend think about this?

In some mills it is a notoriously conspicuous practice to pass the "buck" along to the next man. And for lack of even a half-baked system, the manager and superintendent are at a loss to definitely place a finger on the person or persons guilty of the "bulls," the negligences that are so costly to the firm—particularly those pertaining to the quality of the product.

How do they work this problem in the plant you are visiting? Any firm that does any kind of a business will look carefully to allocating the responsibility for imperfect work where it belongs. Superintendent as well as overseer, section-hand like worker, each and everyone should bear their full share of the responsibility load and should

be brought to account for any violation of their share of the burden. A plant with a discipline of this kind, firmly but not harshly exercised, will always stand at the head of the line as far as quality goes.

Another portion of the managerial territory which it would be well to explore is that of experimental work. This activity covers changes in mechanism on machinery, changes in methods of doing work, changes in kinds or makes of supplies. In fact, any and all kinds of tests to determine better, or more economical ways of doing the work, of improving the quality, or increasing the quantity, of the product.

The management, obviously, if it wishes to ascertain what the results of all these experiments amount to, should make arrangements for the office to tabulate, check, and file for convenient reference all of the tests, also to see that the results obtained in each test check up correctly in every way. This is important; for improperly conducted tests are a waste of time and money.

It is here that the line of demarcation cutting the office from the mill will sometimes assume such prominence as to give it a resemblance to a Chinese wall—almost impenetrable from the mill side. This with particular reference to large plants where so great a number of clerks is required to carry on the details of office work that quite often a class consciousness is developed in which the office personnel become imbued with an excess spirit of egoism.

It is then a case of the mill working for the benefit of the office, rather than the converse, which is what actually should be. Indeed, often for the convenience of someone in the office, the mill will have to go to great inconvenience, to say nothing of the loss of production, increase of manufacturing cost, and decrease in the grade of quality of the product. How does your friend view the relations between the office and the mill?

Welfare work is another function of the office and will naturally include, first aid facilities, athletic activities, community ventures, part-time school and part-time work schedules for the younger element, and educational advantages for both old and young.

Organization of committees from the different rooms or departments to look after the various bifurcations of the many-sided welfare work is one way of creating an immediate and a lasting interest in this feature of management.

Taking up the spare time of workers in innocent amusement is a valuable assistant in keeping the workers minds from dwelling on the radical vaporings that daily are let loose through the many far-reaching modern news-spreading mediums.

The second phase of management (following our original subdivision) would be that of manufacturing. And since workers form perhaps the more important component it would be well to find out if the mill we are looking over has a system of training its workers.

If so, how is this method carried out? Are young workers taken in, taught a certain operation, kept on this for a while, then promoted to another section with an advance in pay and so on, each change in work being a gradual transition, in which the workers only subconsciously realize the stages of advancement of their capabilities?

This problem is most interesting, and is very vital, affecting, as it does, the welfare and ultimate success of the concern. How to get young workers, teach them the rudiments of the work, and then hold them continuously over a period of years so as to get the benefit of the time and money invested in instructing them.

Nationality of workers may have to be taken into account somewhat, particularly in localities where the nationality of the inhabitants is of a homogeneous character. This is especially noticeable in small village mills. Obviously, in larger labor centers, English is the one main medium of expression, and nationality is not so decisive a factor.

An endless discussion could be had on the one topic of teaching new workers, and as great a prolixity could ensue from a talk on the method of dividing the duties. The writer has been in many mills and has noted with interest the manner of laying out the work for the employees. Ordinarily, in a yarn mill, the various duties at the several processes are much alike, depending, to some extent, upon the ideas and temperament of the management and of the executive staff in the mill.

However, one phase of the situation, which mills without number, either deliberately ignore, or never seem to be aware of, to put it in another way, is that of having a

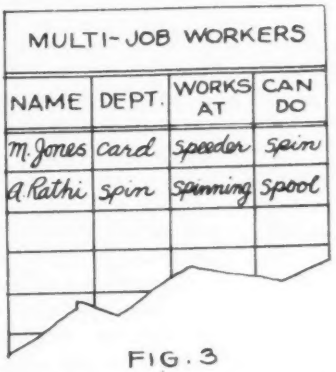


FIG. 3

systematic method of advancing the workers from the simplest job to the most complex. How is this matter handled where you are visiting?

Are the workers' duties specialized? Are they so laid out that there is no confusion as to each worker's exact job, and is care taken to see that no overlapping, no duplication, takes place? Who examines into the duties of the workers to see that each class of worker is doing a full week's work? Who lays out the work of the employees?

Is the mill systematized in such a way that the superintendent must run to the executive offices with every little detail? Unquestionably, here is a point of interest to every operating mill executive. The tendency among large combinations of mills is to centralize the control of all the mills, having one main office from which instructions are issued. As far as possible, each mill is brought into line with every other one in the methods of doing the work and of making out reports.

This is done for the purpose of obtaining comparative results from the mills which will give the management an intelligent insight into the condition of affairs as existent in each mill. Each mill is pitted against every other one, for production, quality, and economy of operation.

The handling of workers often is made the subject of intensive study the intention being to have a uniform system of teaching, training, and handling the workers. How

is your co-executive effected in this matter by the policy of his firm?

A valuable hint, sometimes lost sight of, even in so-called systematized plants is that of tabulating the multi-job worker, Fig. 3, in each department. This multi-job worker is the person with the inborn propensity of quickly picking up the details of any job on which he or she may be put.

For it is a distinct advantage to any mill if a shortage in one section can be supplemented by a worker or workers from another section who are capable of properly filling the vacancy, or vacancies. Every effort should be made to have a few of these workers in each room. How do they view this matter where you are visiting? What are your own opinions on it?

Sometimes it is advisable to have the multi-job workers listed as spare hands, paying them of course a higher rate than would be given the regular spare hands. When not required to fill in full places they could be utilized to straighten out a worker here and there.

Obviously, this scheme is more applicable to a fairly sizable mill. A small concern might hesitate to adopt it, because of the limited field in which such workers could be utilized in a little shop, and the consequent increase in the overhead expense if the services of these workers could not be used productively to the full.

By the way, what is the procedure in discharging a worker? Can a section-hand, when he has a fuss with a worker tell her to "get the h— out of here?" If not, just what must take place before the employee is ostracized from her job? Most any one can fire a worker, but it takes extraordinary ability to make a good worker out of an indifferent one. And, therefore, it is highly laudable for a mill to possess a corps of section and second-hands who can take inferior labor material—when the best is not available—and make first-class operatives out of it. It is always in order, then, to note how other men handle this keystone in the managerial arch.

Inherent in every worker—even if often latent—is the desire to be promoted. This is a healthy, normal instinct, and should be carefully and consistently nurtured by the management. Advancement is what most workers look—or should be led to look—forward to. An advance in money, or to a position which automatically brings the desired monetary increase, or an environment which is muchly sought after—these should be among the loadstones that will attract and hold the more desirable of operatives. How does your friend work his promotion scheme? Just how are the deserving workers promoted? Who promotes?

Obviously, where time workers are employed, there must be some method of keeping a record of the operatives' attendance. Is there a clock system, or is the attendance recorded on cards, or in a book, by the second-hand, section-hand, or clerk?

Taking up now the goods being manufactured, just who decides on the grade of quality that must be obtained? Naturally, no manufacturing process in the textile industry is devoid of faults, so it is but a fair question to ask how the faults are eliminated or reduced to the lowest possible quantity. Is there a record kept of the faults so that increases and decreases may be constantly noted?

Has any endeavor been made to find just the one best way of doing each job about the mill, and has it been made an inviolate part of the system until a better method of doing something is discovered, which, when tried out and proved worthy of adoption, supersedes the older method? Large plants, especially, can benefit by this plan; provided, however, that its fruition in the component mills can be consummated without incurring a prohibitive expense or causing a mutinous dissatisfaction among the workers. This matter should be carefully considered when erecting a sizable plant, or when building a small place which is expected to expand rapidly.

A tender spot, the recrudescence of which occurs, nevertheless, time after time in actual mill practice, is that of

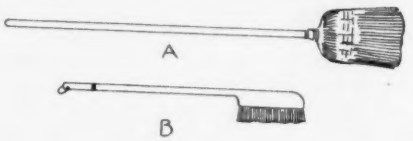


FIG 4

wasting of supplies. Probably this point is one of the most vulnerable in all mills. A half used broom, A, thrown out of this room; a comparatively little-worn brush, B, (Fig. 4) cast from another; a pint of oil carelessly slopped from a container absolutely inadequate for the purpose; spinning travelers flung all about the place by thoughtless workers—these are but a very, very few of the many ways in which supply leakages can occur in the ordinary course of a mill day.

It is instructive then to inquire as to how the other fellow takes care of his supplies, how he has them given out, who gives them out, who examines the discarded supplies, who comments on the too rapid deterioration, or consump-

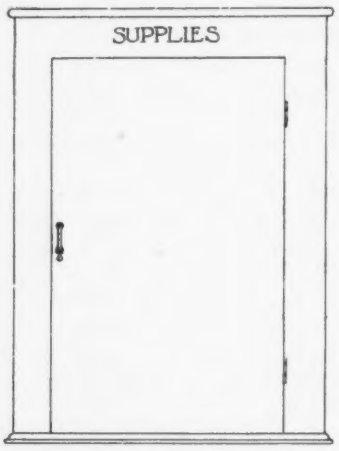


FIG. 5

tion of the supplies, and so on. This subject should be thoroughly aired and viewpoints changed; for here is a place where money can be saved, and saved right away for most any firm.

Are the supplies kept under lock and key? Fig. 5. Do the workers resent this? Or have they been so thoroughly trained in mill economics that they comprehend the necessity for this action? Is a record, Fig. 6, kept of the supplies issued to each section-hand?

The waste in supplies is a reminder that there are other spigots in the mill which can divert the dividends of a

concern into the quicksands of needless dissipation. A very prevalent one is found in the mule rooms and spooling departments, where the cops are so carelessly handled (deliberately or unintentionally, be that as it may), so that some of the cops are actually broken in half, Fig. 7.

In most cases only a small part of these two broken halves can be used again, the remainder, of course, going into the waste box. Many times, it will be found, upon

D. JONESON	
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ARTICLE	QUAN.
Brooms	12
#5 Traveler	1 Box

FIG. 6

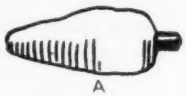
investigation, that broken cops in the mule room are directly attributable to the baseball propensity of the younger element who hurl the cops at one another whenever the section-hand's back is turned. What is your friend's experience?

The analysis of an individual spooler waste record, accurately tabulated, from honestly weighed waste, often

FIG. 7

brings a twinge of uneasiness to the man who is eager to keep his waste at a low mark.

To illustrate: an investigation into the causes of so much more waste being returned by one worker than another when the counts and other conditions are practically identical will often bring to light the unpleasant fact that some of the girls are throwing good cop ends—sometimes



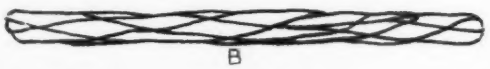


FIG. 8

a quarter of a cop—into the waste box. Examination of these cop bottoms discloses no sound reason for their being so prematurely discarded.

In such cases, usually, the workers should first be thoroughly lectured on the matter of the economics involved in the situation, and then tactfully but in no unmistakable manner told of the drastic consequences that will result to them if the reprehensible practice is continued. The waste box, or boxes, in question should be closely scanned for several days thereafter.

But a word of caution here! A room in which this trouble once occurred, and in which the workers had been duly cautioned, developed another habit fully as unwelcome. The cop ends had disappeared entirely by the end of the first week, but oddly enough the weight of the waste remained the same.

In sifting the matter, it was discovered that the workers were removing just as many big cop ends, A, as formerly, but instead of throwing them into the waste as they had previously done, they pulled the yarn from the paper tubes and worked it up into a spongy mass, B, Fig. 8, that on a superficial inspection would pass for legitimate waste.

These soft ropy pieces, however, could easily be picked out, and a fairly good idea of the size of cop end they represented was readily ascertainable by pulling off a few cop ends and comparing the resultant waste with that picked out of the boxes.

Investigation into the waste of every section in the mill will often disclose a condition like the one above; therefore, it is interesting to learn how other mills meet this situation.

Another leakage that deeply touches the economics of management is that of the needless breakage of spool heads. A nail is to be driven in here or there, no hammer is available, so why then not a spool? Sure! And a spool is used. If the nail is a very stubborn one, then the spool is due for dismemberment—usually a good quarter of the

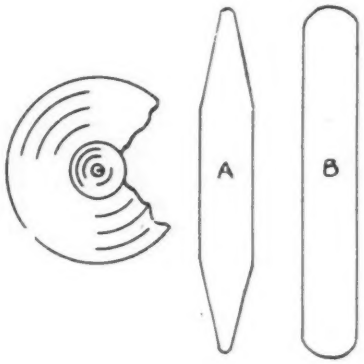


FIG 9 FIG 10

head paying toll, Fig. 9. Perhaps the nail goes in quite easily, in which case probably just a little disfigurement is suffered by the spool head. But—trivial as the damage may appear superficially, the cumulative effect may reach far beyond the cost of several new spools. This is because the ragged edge will catch, then break or entangle the yarn.

Management must also deal with the tapers of the full bobbins in the various sections throughout the mill. Tapers too long, A, will mean increased doffings, require more labor, make more piecings or knots, and lower the higher efficiency otherwise possible if tapers were right; whereas, on the other hand tapers too short, B, (Fig. 10) will, among other things, augment the waste through ravelling, increase the labor cost on account of the time spent in fixing the tangled units, tie up money in bobbins which cannot be used until the snarled yarn on them has been made right, incite the temptation of the workers to resort to that abominable practice of slicing off the yarn from the bobbin thus again making unnecessary waste, not to mention spoiling the spool or bobbin itself, and finally, these tangled bobbins are apt to produce that psychological con-

dition among the help sometimes called "nerves" whereby the workers fret over the ravelled bobbins and not infrequently, if pressed too hard to fix them, will leave the employ of the firm.

Even when the tapers are perfectly all right, an economic loss can ensue if the bobbins are not filled to that fullness that experience teaches is the best. Obviously, however, if overfilled, soiled yarn, broken ends, and very often, ravelled bobbins, ensue.

Losses also accrue through inattention to the starting and stopping of machinery on time. Assume one-half the machinery as starting a minute late on the average a day; also say that one-half the machinery is stopped one-half a minute before each stopping time. Here, then, is the equivalent of all the machinery stopped one minute a day. It is easy to see that quite some production loss is bound to ensue. It is always worth while to find out how this potential leakage is plugged in other mills.

Yarn mills having a large diversity of counts embracing different qualities of cotton are daily facing the prospect of serious losses from mixtures. Sometimes, the mixed work can be retrieved; at other times it is beyond reclaiming. Every such mill should perfect some simple system that will keep the number of mixtures to a minimum, and the management should be thoroughly conversant of the manner in which such a system is carried out. What is your friend's system? Is it as good as yours?

Trivially inconsequential, seemingly, is the matter of workers washing up, noon and night. And yet a long practical mill experience has shown that this is also a matter that will yield good results when properly handled. Let anyone doubting this statement slip unacclaimed into any of the rooms at washing periods, and he will probably wonder how in the world some of the machines can produce anything at all by the time the attendants return after their long chatty sojourn at the wash sinks. Multiply the number of workers of this kind so found by the total rooms in the plant and a problem worthwhile solving is uncovered.

In concluding the manufacturing division of management, a few words will be devoted to the ubiquitous section-hand. An indispensable adjunct of every textile plant, no matter where, too little attention has been given to this keyman of the industry.

For, it is from the ranks of section-hands that the future second-hands, overseers, and superintendents are to come. Therefore, it is entirely in order to question what other concerns are doing to make these men of the utmost value, rather than to accept them as a sort of necessary evil.

A book could easily be written on the one subject of the section-hand, his relation to the workers on the one hand, the employer on the other, and to the scheme of management in general. Indeed, in a scientifically conducted plant, the foreman is the very foundation of the stairway of management. How about it?

The third large subdivision of management is that of the engineering branch; or, in other words, the mechanical department. A moment's reflection will make instantly apparent that in a fairly sizable plant this section has a tremendous proposition to deal with, and a gigantic responsibility to shoulder.

One of its first important duties is that of keeping tabs on the power establishment. Here alone, are presented innumerable opportunities for intercepting and eventually eliminating or minimizing annoying leakages of various kinds, great and little.

Speeds of machines also come under the jurisdiction of the engineering branch. Obviously, the matter of deciding the speed best suited for the product may not be within the purview of this department; nevertheless, it should be required to make any changes necessary to bring about the proper speeds, and to help maintain them.

Every mill man of any extensive experience knows that some machines in a mill are overspeeded, while others are underspeeded. It should therefore, devolve on the executive section of management to make tests that will prove

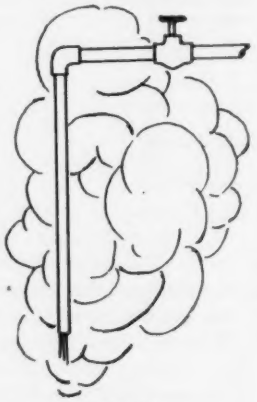


FIG. 11

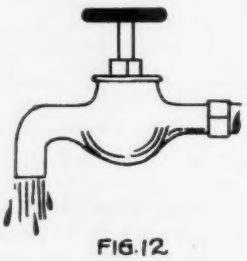


FIG. 12

conclusively which speeds are the most economical to run and the engineering branch should be notified of these speeds and requested to hold them up to the set standards.

One of the troubles with speeds in large plants whose machinery is housed in separate buildings, often widely separated, lies in the great divergencies from the speeds settled upon. These divers speeds come creeping, one by one, incipiently into the organization, until an investigation discloses a heterogenity rivaling the 57 variety kind.

Steam is a mighty good agent of production in its proper place, but to have it blowing out unrestrainedly from dozens of defective valves, Fig. 11, all day long is an auto of a different make. There, then, a regular system of inspection and repair under the direction of the engineering department will in the course of time reduce these steam leaks to negligibility.

Conservation of power is another item that comes within the domain of the mechanical department; but which this section often overlooks or entirely ignores in some mills. Belts too tight are rapacious consumers of power; and yet few mills are there which could not by intelligent and persistent effort reduce this leak to a considerable extent.

The practice of leaving the belts on machines (especially large belts) which for one reason or another cannot be run for some time, a day or two, perhaps, is another source of needless power consumption which the mechanical department should report on, and follow up. Another altogether too frequent offender in this respect is the motor running when its load of machinery is stopped. Sometimes just one machine alone may be running on the section driven by a motor. And as like as not right in an adjacent section driven by another motor there may be

one or more machines stopped. The simple matter of transferring the work from one machine to the other would have permitted stopping the motor and thus saving considerable power! A wideawake engineering department can tip off the superintendent who can then take steps to prod the overseer of the room for his laxity.

Water faucets, Fig. 12, have an uncanny habit of leaking for weeks at a time without anybody seemingly becoming aware of the fact. Frequent, periodical inspection and repair by an employee of the mechanical department will go a long way toward reducing this source of loss.

It would be well to ask if a record is kept of the repairs or renewals to the machinery. Many a good dollar has been thrown away in needless duplication of machine parts, and many another dollar has been lost because of the inefficiency of machines through lack of proper parts—and all this for lack of a system of recording repairs and renewals, and then following them up systematically. Is this your friend's experience, too?

How are the repairs ordered done? By word of mouth, memorandum, or regular order form? Is the cost of repairs for each department closely followed up and explanations required for repairs made which appear as unnecessary, or too frequent? Can anybody take a part to the mechanical department and get it fixed and renewed?

Does the mechanical department keep a jealous eye on the welfare of the machinery, making periodical overhaulings? Is the engineering department responsible for the replacement of old, decrepit machines? Who condemns the machines? Who buys the new?

The various functions that can be profitably exercised by the engineering department could be expanded into a volume of best seller size and still leave as much and more untold. Similarly with the other two main branches of management as herein discussed. And finally may be included the entire subject of the cotton yarn mill. It would be presumptious, indeed, to say that every phase could be properly handled by any one writer. The best that can be hoped is that some of the various points dwelt upon will furnish sufficient matter for thought and action as to have made the reading of the subject well worth the while.

EDITOR'S NOTE—This is the seventh and last of a series of articles by Mr. Soniaman. The questions asked are open for discussion in our regular department entitled "How Other Men Manage." All readers are invited to participate. It is not to be expected that all will agree, but it is quite probable that each man will have his *reason why*, and that is what makes it interesting.

Orders or Thumb Marks?

BY U. DODGE.

"Hold still, Wof," said Mr. Otis Himback.

He clamped his foot on the brake pedal and brought the companion of his endeavors to a chattering stop. "Lemme go see can I grab off an order here. If I do, we go home tonight and see the widow and orphans. If I don't, we keep hooking. Better cross your headlights and give us a couple backfires for good luck. If things don't pick up, I know a peddler who will be looking for another job. Try not to leak any more oil than you can help while I'm gone, and for the love of all the mile posts from here home, don't get another flat. These washboard roads got my back hurting enough now without having to pump you up any."

Inside the office of the large mill toward which he had been heading for the past hour, the salesman encountered a newly placed iron lattice, behind which a colored boy slowly masticated a wad of gum with a rotary motion of the jaws. "Huddy, Mr. Hymnbook," said the boy.

Mr. Himback shook the door of the lattice, and finding it locked, became vocal. "Don't get fresh," he admonished. "When did this thing get put up? Makes you look natural, behind the bars. Run quick and tell the boss I'm here. Hustle, now."

"Card," said the boy.

"Card! Well, here. Be sure you give it back when you get through with it. That's my last card, and it's got to do a couple weeks longer. First time I ever had to produce a name plate in this joint. You tell the boss he's putting on a lot of style."

"Yassuh," the boy agreed. "Drummers bothered us too much. Most run my laigs off findin' th' super fuh travelin' gentlemen. As't him fuh pair roller skates an' he boughten that fence." He disappeared into the back office from which he presently emerged still bearing Mr. Himback's card which he poked back through the fence. "He say he's too busy," he yawned and resumed his bout with the gum.

The salesman was flabbergasted. Heretofore he had always been accorded a very friendly welcome by the man who presided over the destinies of the plant, the busy clamor of which, for the first time in the several years he had been visiting it, seemed now to come to his ears with a mocking tone. He thought he could also detect in the eye of the boy a glimmer of amusement at his rebuff, and he rattled the fence again.

"Hey," he shouted, "you go back there and say it's Mr. Himback, and be darned sure—"

"Yassuh," agreed the boy. "That's what I 'lowed. Said he was too damn busy, but I didn't say it thataway th' fust time. I's a deacon in th' chu'ch. You say not to ferget th' card. Hyuh hit."

Otis kicked viciously at the square of cardboard as it fluttered to the floor, and went out and kicked his car in the differential. He climbed into the seat and stamped the starter. "Start up, Wof," he commanded.

"Howcome you calls hit a Wof?" inquired the colored boy as he followed with the card which he deposited carefully in the rear of the car.

"A Wof," explained Otis, "is a worn out flivver, and believe me, this thing will be a whole lot more woffier than it is now before I come back here to be treated this way. Anybody would take me for a case of measles."

His traveling companion searched around in its anatomy, found three cylinders and got started, found a fourth and moved off. The super, disturbed by the racket, put his head out of a window and expressed his opinion by a thumbed nose. Mr. Himback had often been amused by this man's habit of doing ridiculous things when he thought nobody was looking, but he didn't see anything funny in this particular farewell gesture. He forgot his resolution

to keep hooking, went into high and stayed there all the way home. All that happened along the way was a dished front wheel and a bent front axle, which proved that no one, no matter how long, can hold a car in the middle of a washboard road and at the same time reach a leg over the back of the seat and stamp on a visiting card on the floor in the rear.

He didn't take his grouch out on his wife, because, being a wise woman she cooked him up such a tough steak that the eating of it chewed off most of his bad temper, but the next morning when he got ready to start out again and saw the card still in the bottom of the car—phew! He picked it up very carefully and threw it out of the garage door.

He thought he was done with it, but he wasn't. Good luck pursues us sometimes as persistently as bad. That card didn't sail out through the door and into the bean patch as it should have done. It connected edgeways with a crack by the side of the door in such a way that when Otis started to back the car out and twisted his head around to see where he was going, he found that card right at the end of his nose, sticking out like a semophore at a street crossing. Heretofore he had seen only the face of it, on which his name was printed. Now the back was turned to him, and on it, in the plain script of his super friend, was written, "Send me six of the darn things in a hurry."

Now it so happens that six of the "darn things" is a somewhat larger order than Otis generally gets. They would constitute a successful week by themselves if he didn't sell anything else. So it followed that after he had stared at the card long enough to realize that he was looking at a somewhat unusual but perfectly valid order which would change a very disappointing week into a remarkably good one, Mr. Himback began to think of a lot of other things all at once. He realized that he had better go by the office and see that the "darn things" were shipped. Also he began to understand that the colored office boy's actions had merely been a part of the conspiracy, especially the care with which he placed the card in the car, and that the super's farewell had been expressive of good wishes, and not contempt. All of which led him to a long distance 'phone where the following conversation transpired.

"Hello! Central, gimme Long Distance. Hey, Long Distance, I want you to call the Whatsname Mill over at Kinkston and get Mr. Watt Tell—huh?—Watt Tell. No, I ain't swearing at you. Say, listen. Let that next girl have your chewing gum a minute so you can hear, will you? I want—huh?—yeh, all right, all right, just make it snappy. Here's your fifty cents." *Ding.*

"Hello, Mr. Tell, this is Himback. I just wanted to express my appreciation of the very fine order you gave me yesterday. That certainly was a good joke. Say, listen, you know I like to not found out there was an order on the back of that card. Of course I would have when the confirmation was mailed in, but I didn't see it until this morning, honest. I was trying to throw it away. What do you know about that?"

"Oh, yes," came Mr. Tell's voice. "About that card? Well, life's a good deal like that, Otis. Did you ever stop to think that everybody you meet is like that card of yours? They have two sides. One side they show to the world. It's a mere sterotyped announcement of their existence. With some it's a little more elegant than with others, like the difference between an engraved card and one that's merely printed. In our business it would probably read

MR. MILL MAN

On the Job

and with most of us I guess it would be one of the cheap printed ones with nothing to recommend it but the honest work that went into the making of it. That would cover what the world sees of us in most cases, but what about the other side? There must be something there. The backs of visiting cards can be blank or have good orders on them according to circumstances, but not folks. There must always be something there, if it's nothing more than dirty thumb marks.

"You know how it is, Otis. You meet men and women from day to day and you find them all about the same. Most of them are apparently nothing more than frames to hang clothes on, and you'd say they were all cut from the same chunk, but you know that's not true. There's a difference between them. What is it? It's what's written on their backs. Not their flesh and blood backs, of course, but the backs of their souls, you might say. How do you do it? Well, you have to flip 'em over, somehow, and the method is not the same in all cases.

"What you see written on their front sides for the world to read is hardly ever a good indication of what's on the other side. One says elegant and refined and another says roughneck. One says society dame and the other says working girl. What's the difference between them? Old man Elegant and Refined may have put poison in his rich uncle's coffee, and the roughneck may secretly be supporting all the sick old ladies in the neighborhood. The society dame may be the meanest cat that ever talked a reputation away, and the poor little working girl may have a heart of gold."

"I thought you'd get around to some sort of girl after a while," said Otis. "I suppose the working girl with the gold filled heart would have to be good looking or she wouldn't be the type. If you get any more sentimental and go and cry in the 'phone, it won't work."

"Time's out," said Central. "Put in fifty cents more, please." Otis complied, the 'phone said *Ding,* and Watt went on.

"The trick is to find some way to flip 'em over and find what is on their other side, and the best way that I know of is to catch them at their recreations if they have any. Then they are natural. Then they are at their real selves. Some poor unfortunates haven't any recreations. I read the other day about a man who stuck to one job for fifty years, and when he got too old and they turned him off, the poor devil couldn't think of anything to do but to lie down and die. He had only one side. When that was rubbed off he was a blank. He had put his whole life into that one

little job, and I'll bet it wasn't much of a job at that—because a man that will hold his nose that close to his work can't be expected to see much beyond it—and when his job stopped his life stopped with it."

"Yeh," agreed Mr. Himback. "You bet your neck if my job stops, I do too. So does my grocer and everybody else that hears about it. It's all right for you to moralize at me over the 'phone at the rate of fifty cents every three minutes so long as I pay for it, but I'll tell you this, a man—"

"Everybody knows," Mr. Tell went on, "that if you get too close to a thing you can't see it. Distance doesn't always lend enchantment to the view, but it does give it the proper perspective. You see it in its real proportion and relation to other things. Sometimes, if you get far enough off and look at yourself and your job, it surprises you to see how small the two of you are, added together. That sounds like a physical impossibility, but it can be done. All you need is to get your mind off yourself for a while and give your eyesight and egotism a rest, and when you come back for a fresh view you'll more than likely get a new slant at yourself that will change your opinion about a few things.

"The way you do it is to have a hobby, to get around on the other side of yourself for a while, and give the business side a rest. It sort of keeps you balanced, and the way to find out other folks is to see what they do, not for amusement, because we all do about the same thing for amusement, but for recreation, which is something different. That is something that is very necessary to all of us, although it doesn't have to be of any value in itself. So long as it is something that re-creates you, that shines you up and brushes off the dust of monotony and the smudges of boredom and gets you all cleaned up and ready for another business call, it will serve a useful purpose.

"I knew a man once, who got a two weeks' vacation and didn't do a thing but sit home and read all that time. After he got back to work he couldn't tell what he had read except that it was a lot of cheap novels, but the way he tore into his work convinced everybody that he was a better man for it, simply because he had been having a good time according to his own ideas."

"Time's out," said Central. "Fifty cents, please. Mr. Himback reached into his pocket and the 'phone said *Ding.*

"Some such recreations, however, have proved to be of more benefit to others than to those who pursued them. Think of what the world owes to folks with the collection hobby who spent valuable time and money accumulating a lot of junk that afterward turned out to be priceless objects of beauty, utility, or historical interest. Think of the wonderful gifts that have come down to us in the way of music, literature, art, science, medicine, and numberless other things from folks who have made them their recreation. The world owes them a tribute which is often paid too late. A person engaging in business and attaining what we call success, attains only a personal benefit, but a person with a hobby is not worrying about business in connection with it. Most of the time his hobby is of use only to him, but there have occasionally been folks whose hobbies were of immense benefit to the world at large—folks who have changed the history of mankind by what was on their other sides.

"Superficially they were failures, most of them. That is, they were business failures. But after they had endured in poverty a while and dragged their rags before the scorn of more prosperous folks and starved in garrets, some of them, and passed on, the world began to find out that important orders had been written on their backs, the backs of their souls that the world didn't see or didn't recognize the worth of while they were here. Orders for poetry, for song—sad songs some of them—for mirth, for great learning or great works in words or stone, and sometimes merely for good fellowship and brotherly love, which are the most important after all."

"Ain't it the truth," agreed Mr. Himback before he thought. "I've always said myself that there's many a ragged pair of pants covers a warm and generous heart."

"But there are some poor unfortunates who have nothing on the other side but the thumb marks of the dirty side of life. They go around awhile to all appearances the same as other folks, and then something flips 'em over and we see them as they are. The pity of it is that somebody put those thumb marks there. The jails and the hospitals are full of them. We put them in there to try and clean them off so that they can be presented to the world once again, ready to pass with the rest of us and be useful. I wonder how many of us can look ourselves in the eye and feel sure that never, by word or deed, by precept or example have we influenced other people in a harmful way—left thumbmarks on them. It's a big question for anyone to ask himself. I doubt if the answer would be satisfactory in all cases."

"Time's up," said Central. "Fifty cents, please."

Otis groaned and came across. *Ding,* said the 'phone.

"So you see, there was more to that card than you thought when I sent it back to you. Now there's another line of thought—"

"I don't want to hear it," roared Otis. "If you think I'm going to sit here all the morning and listen to such stuff, you're wrong. It ain't worth the price." He banged the receiver up on the hook, and at the other end of the line, his super friend leaned back in his chair and laughed until the office boy became alarmed."

"Sweet spirit," he exclaimed. "That sure was hot stuff. Say, boss, I gotta make a talk Wednesday night. Howcome I caint speak some of them words? You oughtn't to charge me nothin'. Mr. Otis' done paid for 'em to th' telephone."

"A dollar and a half," growled the drummer as he clamped his hat on. "The old windjammer. Next time I'll wire him." The bell in the booth tingled pleasantly and before he thought he took the receiver down.

"Mr. Himback," a voice said sweetly, "you owe us twenty-five cents more. One minute and a half."

Ding said the 'phone, and Otis said something that can't be recorded. He went out and kicked his car in the differential. "A dollar and seventy-five cents' worth of philosophy," he informed the companion of his travels. "Well, maybe it was worth it." He stamped the starting button. "Get started, Wof," he commanded. "Let's go."

A photographic presentation of the company's service to the textile industry is given in a booklet just issued by Lockwood, Greene & Co., Engineers, showing photographs of representative plants in the South with which they have had engineering connections.

Texas Textile Men Meet at McKinney

The semi-annual pilgrimage of Texas operating executives wended its way into the attractive city of McKinney, Texas, just north of Dallas, on Friday, May 8th, for the 10th annual convention of the Texas Textile Association, which was held on Friday and Saturady, the 9th.

An unusually large attendance of mill men was especially significant as indicating the wonderful growth in the organization since its formation in Dallas, ten years ago, by a group of twelve foresighted superintendents. There was also a garnishment of salesmen, and others, who are always made to feel cordially welcome at these Texas meetings.

Following the trend of the past several conventions, the feature of the program at McKinney was practical discussion of mill problems. This discussion covered a wide variety of technical subjects, and also touched extensively upon the human relationship problem in the mill. A seriatim report of the discussion is contained in the following paragraphs.

Informally, the convention began with the arrival of members at noon Friday. A number of the leading members of the Association, with some visitors, were guests at the regular luncheon of the McKinney Rotary Club. Al Culberson, vice-president and general manager, and J. C. Cosby, superintendent of the Texas Cotton Mill Department of the C. R. Miller Mfg. Co., at McKinney, were hosts at this occasion, and, as well, served as the capable hosts for the convention. At the Rotary luncheon, brief talks were made by W. H. Gibson, president of the Texas Textile Association, of Waxahachie; D. H. Poole, secretary, of Sherman; C. S. Tatum, past-president, of Bonham; J. B. Bagley, textile director, A. & M. College, College Station; Sam P. Rakestraw, southern agent, Seydel Chemical Co., LaGrange, Ga.; H. E. Runge, Draper Corporation, Atlanta, Ga. and others. Robert W. Philip, Associate Editor of COTTON, Atlanta, discussed the application of the Rotary slogan—"He profits most who serves best"—as exemplified in the discussion meetings in the textile industry.

Officially, the convention opened at 3:30 o'clock Friday afternoon, with registration of members at the cotton mill office. After a group photograph had been made, the delegates inspected the mill in a body—a custom carried out at all of the Texas meetings. McKinney citizens then carried the visitors on an automobile tour of the city.

At 6:30 o'clock a delightful buffet supper was served at the McKinney Coliseum. Musical entertainment was furnished by the Texas Cotton Mill band of McKinney. Later, the meeting was called to order by Mr. Cosby, who, after some songs led by Mr. Runge, called upon Mr. Philip for the invocation. Mr. Culberson then extended a welcome on behalf of the mill organization, and Tom W. Perkins, mayor of McKinney, welcomed the visitors as a representative of the city. E. F. Renkin, of the Texas Power & Light Co., spoke briefly. Robert W. Philip, of Atlanta, responded on behalf of the visitors.

W. H. Gibson, president of the Association, who is superintendent of the Waxahachie (Texas) Cotton Mill, assumed charge of the meeting and presented the annual address of the president.

"As leaders in one of the country's great industries we superintendents and overseers, to my mind, have a responsibility and an obligation to three interests: to the companies by which we are employed; to the employees of our companies; and to the general public.

"Our first duty, to the companies we represent, is that we should be loyal to them and strive to make them returns on the investments they have intrusted to our care and direction. Some one has well said, 'Do all you are paid to do and then some.' It is the 'then some' that counts, and marks us as leaders in our respective businesses. Not only should we strive our utmost for the companies, but we should take care of the properties we operate. There are many ways of doing this.

"Our next duty is in the interest of our employees. Most of us want to be fair with them, and see that they receive ample pay for their services, but there are a lot of other things we can do for them. Loss of time and expense in being sick has been estimated at $1,500,000,000 annually. We can help eliminate much of this financial loss and human suffering by having sanitary conditions around our plants, and proper safety safeguards in our mills, and by properly instructing the employees about accidents, not only to themselves, but to their fellow-workers. Science in the short space of 300 years, has prolonged the average life of man 38 years. Scientific measures can accomplish more in the future if we will but apply them in our daily work.

"We should encourage thrift among our people. It is

true that the earning capacity of the average employee does not permit him to save a great amount, but you all know that all of them could save more than they do. We should encourage and advise safe investments for them. Statistics show that out of every 100 men, only three, at death, leave estates of more than $10,000; 15 more than $2,000; and 47 leave nothing, after having worked for all their lives. In old age 35 are dependent upon relatives and charity for support. All of us can't be wealthy, but we can accumulate more than we do, and by saving we become better citizens and worth more to the communities in which we live.

"The interest of the general public is the third obligation we should consider. We are born into this world for some purpose, although we may never accomplish it. Each of us here today is indebted to some individual for the position we occupy. Someone had confidence in us and gave us our job. We owe to the public a debt in return for what the public has done for us. If we borrow money from a bank or an individual, we pay it back, with interest. If we owe the public anything, we should pay it back, with interest."

Following his own remarks, Mr. Gibson opened the meeting for practical discussion. This discussion, led by Mr. Gibson and Mr. Tatum, superintendent, Consolidated Textile Corporation, Bonham, Texas, followed the lines of a questionnaire previously sent out to the members. Introducing the first question, Mr. Gibson stated that, "in the event a mill had on hand several thousand bales of 7/8-inch cotton, and a large amount of 1-inch cotton, which would be more practical: to run it out separately, or mix the two lengths and work them together?"

Mr. Tatum, who sent in the question, spoke first. "I might explain why I asked the question," he said, "Last year I woke up suddenly to discover that I had on hand about 3,000 bales of cotton ranging in staple from 7/8 to 1 inch—probably some of it was 3/4-inch.

"As most of you know, we are spinning 22s to 24s, with single creel in spinning, and it was a problem, that I had to solve, whether it was better to make a 'Duke's mixture' out of those two lengths and run it together, or to try to separate it into the 'long' and the 'short' and set the rolls to the 'short' and run it up, and then set it to the 'long' and run that up.

"I think most everyone I have ever heard will say it is better to separate it—that it is not a good idea to mix it. I advised with some of the best authorities in the country on this subject, and they said not to mix it. I decided I would follow this advice, and separate it, and run up the 3/4-inch before hot weather. But we hadn't been on it many days before the spinning room looked like it was ready to shut down. We set our rolls up as close as we could get them, but the 7/8-inch cotton would not run.

"Then we decided that we would have every bale stapled and mix it according to an average percentage every day. We sorted it in three lengths and put in each mix the same number of length 1, 2 and 3 each day, and it made a marvelous improvement in the running of the work. I believe the reason people advise separating it is principally because of the longer-stapled cottons. I think if you were running 1 1/4, 1 3/16, and 1 3/8-inch cotton, that would be the way to go about it—you could adjust the rolls to the different lengths. But you cannot close up the rolls enough to run 7/8-inch cotton—we couldn't—and I am convinced that it doesn't pay to separate it with our cotton."

"I think Mr. Tatum's right about it," said C. B. Brady, overseer of carding, Sherman (Texas) Manufacturing Company. "Running that 3/4 and 7/8-inch stock you can't set the rolls close enough to carry it."

W. B. Hollingsworth, overseer of carding, Denison (Texas) Cotton Mill Co., stated that he tries to get a good mixing by taking 11 bales of "short" and 11 of "long" in a daily run of 22 bales.

"I really think if we can get all of the cotton within 1/8-inch variation, we needn't worry about the staple," said J. T. Mooney, overseer of carding, Texas Cotton Mills, McKinney, Texas. "I think our biggest difficulty in mixing is not so much in the length of the staple, but it is in mixing cotton grown in different sections of the country. You can take an Ok'ahoma cotton that is wiry and curly—Strict Middling—and a Strict Middling raised in some other state, that is soft and silky, and mix these staples, and they will not hold together. It will cause lumpy work and produce weak yarn. I think we should pay more attention to where the cotton comes from. Of course I am like Mr. Tatum—when it comes to the long staples I think it would be well to separate it, but the cotton that we get from Georgia and Alabama, and from around here, runs from 3/4 to 1 1/16, and I think it pays to mix it together."

"My experience in the mill business has demonstrated that mixing different grades of cotton doesn't have so much effect on the running of the work as the cleanliness of the work," declared W. F. Smith, superintendent, Waco (Texas) Twine Mills. "In other words, we know that when we are carding cotton it is impossible to get out all of the short staple in the strips. Most of us take out five per cent. You will have them all the way through the work. That's on carded stock, of course, if you are combing it, that's a different proposition.

"But my experience on coarse numbers, with low-grade cotton (and low-grade cotton is immature cotton) is that by setting the rolls to inch-cotton you should be able to run from 3/4 to 1-inch stock satisfactorily and make a good stout yarn. From pickings—gin pickings, etc.—I am making what we call a No. 2 twine which breaks over standard. In that stock we get a variation of staple. Sometimes it runs over an inch, but of course when that hits us we have trouble in our spinning, because it will not draw evenly. If Mr. Tatum sets his rolls up as close as he can get them, with a 1-inch roll he can't get them close enough for the 7/8-inch stock. If he is going to run that short stock by itself he must get a smaller diameter of front roll, and make the rolls mesh enough to take that short staple. I think he is on the right track in mixing it; although he may have fuzzy yarn, he can eliminate this."

M. D. Leeik, overseer of carding, Worth Mills, Inc., Fort Worth, Texas, agreed that "Mr. Tatum is doing the only thing he can do. The best method I have found for mixing several different staples of cotton is to get an accurate account of each bale and put the mix up systematically."

Mr. Gibson pointed out that even within one bale there will be found variation, running from 3/4 to 1 inch, and that in stapling cotton it is very easy to pull inch cotton out of a sample that actually contains a very large percentage of shorter stock.

The next question taken up was, "What do you know about spraying cotton with oil in the opening room?"

Under this heading, G. E. Van Tromp Govier, chemist,

A. E. Staley Manufacturing Co., Decatur, Illinois, discussed the subject, "Some Problems Connected with Oil Spraying Raw Cotton." Mr. Govier's paper was based upon the statements made in the discussion of this subject at the Textile Operating Executives of Georgia convention in Atlanta on March 18th, and articles resulting from this discussion. He pointed out that there are important problems regarding the possible effect of this oil in the later stages of cotton processing. To compare the oiling of cotton with the oiling of wool is a mistake, he stated, since the conditions involved are very different; that in raw wool, the fiber is deprived of its natural greases by scouring; but that in raw cotton stock, not dyed, the fiber has not been cleaned, and its natural amount of natural oils and waxes are still contained by the fiber to the extent of approximately four per cent, as stated in a recent article in COTTON.

The addition of the recommended one per cent of oil to the natural waxy content of four per cent in cotton, he pointed out, adds to the effect of the natural waxes in the penetration of the size mixtures, as discussed in the February issue of COTTON. The article in question stated that the fiber is coated with a mixture of waxes which resist the penetration of the starch mixtures to the surface of the fiber, repelling the desired starch film. Mr. Govier feared that the addition of the oil would increase this repellent condition of the natural wax.

Mr. Govier declared the ideal properties for an oil for spraying are that it must lubricate efficiently, allow penetration of the size, be perfectly stainless, be saponifiable, be easily removed in bleaching, and must not defeat the efficiency of the humidifiers, repel moisture or affect dyeing.

That many advantages might be secured in the form of static elimination, prevention of rusting of steel parts of the equipment, reduction of dust and lint, was conceded by the speaker, who also pointed out that tests had shown that the removal of all the natural oil from cotton increased the breaking strength. If this observation is correct, he stated, it would not seem probable that an addition of an extra one per cent of oil would produce an entirely opposite result. In considering the kind of oil to be used, Mr. Govier, by the standards of the elements given in the preceding paragraph, eliminated practically all of those oils now used in woolen mills, declaring that to his opinion a sulphonated corn or cottonseed oil would best answer. He objected to mineral oil on the grounds that he knew of no mineral oil that was soluble. A sulphonated oil, he said, would be hygroscopic, would have no waterproofing effect on the yarn at the size box, would have no detrimental effect upon the humidification, would lubricate, and could be removed at the finishing plant.

After Mr. Govier's paper, one of the men present asked what kind of oil would be best to use, since they needed something that doesn't stain. "I stated in the paper that I thought sulphonated oil would be best because it is stainless and perfectly soluble, and will wash out in the bleachery," answered Mr. Govier.

"What per cent is being used?" asked Mr. Smith, "and would it accumulate enough short fibers to repay for it." Mr. Gibson replied that in the process being used, "the oil takes care of itself, in that it costs only ten to twelve cents a pound."

"As I understood it," said R. N. Staples, overseer of dyeing, Planters & Merchants Mill, New Braunfels, Texas, "Mr. Govier recommends the use of a sulphonated castor oil. From what I understand from old dyers and bleachers, this would give trouble in spinning. We had some trouble at New Braunfels, with raw-stock dyed stuff, and on certain colors the cotton would roll up on the top roll in spinning, and it was very hard to get it off. When these dye salesmen and others would come around they would tell us that that was the cause of it."

"I recommended corn or cottonseed oil," replied Mr. Govier, "and not castor oil. Castor is very viscous and would have the property of gumming up the rolls. Cottonseed and corn are not nearly so viscous."

"At one time I was using a sulphonated castor oil, in dyeing, that had a little corn in it, and it was worse than ever," said Mr. Staples.

Someone raised the question of mineral oil, and Mr. Govier replied that this would be satisfactory if it were soluble. "It can be emulsified with the proper agitation," he said, "it can be emulsified in a tub and make a permanent emulsion, but not on the fiber."

At this point Mr. Philip read sketches from the discussion at the Atlanta meeting of the Textile Operating Executives of Georgia, in March, where the widespread interest in the subject was generated. This report appeared in the April issue of COTTON.

"I think it is well to get all the information you can on a subject," observed Mr. Tatum. "When I heard about this proposition, I wrote to a friend of mine in Georgia who, I knew, had been experimenting with it. He said that it reduces the fly around the cards, but that he thinks, but is not sure, that it reduced the breaking strength in spinning; that they have gotten no advantage in the spinning room; and that he is under the impression that it is not going to do him any good. He says, however, that a mill without enough humidifiers would profit by this more than any other. He believes that the dry climate of Texas would prove a good field for it. He uses the same oil that the others in Georgia do, with the same type of sprayer.

"I notice that everybody who testified at the Georgia meeting seemed in favor of it, and I thought we might like to get both sides. This friend of mine is on white goods, about 22s warp and 24s filling, about the same yarn we are on at Bonham, and I notice that the most of the mills reporting benefit from it are colored goods mills. In these cases, it is similar to treating wool, as the natural oil has been removed in dyeing and I suspect it would be a help on colored goods more than any other kind."

"I am sure it would be a help in the dyeing," said Mr Smith. "I use an indigo assister in the dyeing, on direct colors, to make the cotton sink well and penetrate well."

"I represent the Borne, Scrymser Company, who make this Breton Minerol process of spraying," said Leon W. Campbell, "and within two months we will have two plants in Texas running on it. That will be the best proof. I believe you will find that with your static conditions out here this process will be a big advantage. Our people have spent several years in getting this oil soluble, which has been proven out in over 200 mills in sulphur dyes and other dyes. I think Texas is a wonderful field for it on account of your static conditions."

Mr. Gibson declared that the use of the oil in colored work is not something new, as in 1901 he knew of mills on raw stock dyed work using an oil of some kind on their cotton to make it run better, because in dyeing the natural oils were removed.

"Will your process be satisfactory on vat dyes as well as sulphur?" Mr. Staples asked Mr. Campbell. "Yes," was the reply, "on any kind."

Leaving this subject, the chairman next presented the question, "What percentage of production do you get on fly frames?"

A summary of the answers given follows: W. B. Hollingsworth, overseer of carding, Denison, Texas, 85 per cent on intermediates, 1.30 hank roving; E. L. Ellison, overseer of carding, Waxahachie, Texas, 81 per cent on slubbers, 83 on intermediates, with local cotton; H. A. Burow, overseer of carding, Bonham, Texas 92 per cent on speeders, average Middling cotton; W. F. Smith, Waco, 80 to 82 per cent on intermediates, low grade cotton; G. C. Dilling, superintendent, Brazos Valley Cotton Mills, West, Texas, 80 per cent on intermediates, 1.27 hank roving; C. B. Brady, overseer of carding, Sherman, Texas, 93 per cent on intermediates, 1.43 hank roving; D. W. Lance, superintendent, Hillsboro, Texas, 81½ on intermediates with Middling cotton. These percentages all are based on the actual front roll speed and not the catalog or shop speed, it was indicated.

The next question was, "How often should spindles be plumbed, and frames lined and leveled?"

L. B. McBride, overseer of spinning, Bonham, Texas, stated that in his opinion this depends upon "what shape you are in." He said they have some frames, put in some years ago, that they go over every year, but later models do not require it more than once in two years.

"I find in starting a frame up new that the spindles will go for two years," said Mr. Smith, "but after that the spindle will get out of balance, out of plumb, out of true, once a year, and when you renew the bolster you must renew the spindle. All bearings worn out should be taken out, and all worn journals. It saves power and eliminates costs and upkeep."

Mr. Ford, of Dallas, said he thought frames should be leveled and lined and spindles plumbed "as often as the superintendent will let the overseer do it." Five present indicated they do this at least once a year, by a show of hands.

"We line and level every two years and plumb the spindles once a year," reported Mr. Mooney.

"I think they ought to be lined and plumbed once a year," said Mr. Sord.

"The scraping of the steel rolls on coarse numbers ought to be done twice a year," said Mr. Smith.

"Yes," agreed Mr. Sord, "on 8s, 9s, 12s, etc., it should be done every six months, but on the finer numbers once a year is enough."

Mr. Gibson brought out that the settling of the building would have some effect on it; that if the machinery is on a bottom, concrete floor it is not necessary to line and level the frames every time the rolls are cleaned.

"There is a whole lot in taking care of the machine," said Will Burrus, overseer of spinning, Dallas, Texas. "If a frame is on a solid foundation I do not see why it should be lined every year."

There was some disagreement as to the frequency with which this work should be done. Mr. Smith pointed out further that "if a spindle is not in plumb, you have a heavy side with your traveler, which wears your ring into ridges and you cannot spin a smooth, perfect piece of yarn. If the spindle is plumbed once a year and new bolsters put in you eliminate the wear on the ring and traveler. A spindle out of plumb takes the elasticity out of the yarn, and you hear the weavers grumbling about the warps running bad."

Mr. Smith outlined the practice of the Bibb Manufacturing Company, of Georgia, with whom he was formerly associated, saying that they keep a crew of overhaulers to visit their several plants and the superintendent and overseer of the local plant are expected to supervise this overhauling. The Fulton Bag & Cotton Mills, of Atlanta, he said, scald and burnish the rings.

"In the meantime," reminded Mr. Sord, "you must keep your spindles oiled well. My experience has been to oil them every two weeks."

The next subject for discussion was, "What percentage of twist is added to yarn in spooling from filling wind?"

"I think that depends on what tension device you have," replied Mr. Sord. "The stouter your tension the less twist you have. On our tension I do not believe we have any twist added at all."

In explaining the question, Mr. Dilling, who had asked it, stated that "I discovered that our yarn was heavier at the warpers than at the spinning, and I began to look into that. I found that the spoolers increased the weight of our yarn about twenty points, on 9½s. I concluded that it did add twist." He explained a similar situation was that of unwinding a roll of belt, where twist could be observed going into it.

"In other words, if you had a left-hand twist in the yarn, it would take twist out," observed Mr. Gibson. "Yes, if you could turn the bobbin upside down it would be the same," said Mr. Dilling.

"Would it be practical to go over spinning frames and cut off slack bands at certain intervals?" was the next question presented by Chairman Gibson. He explained that oftentimes a band, on becoming slack, will run for quite a while before it comes off, and the question referred to the advisability of an established interval for examination to detect such bands.

"If a man is using a yarn band, I think that is all right, but with roving bands I never could see where it was necessary," declared Mr. Dilling. "If it is tied on right as soon as it gets slack enough to make slack yarn it will come off."

Mr. Tatum, who asked the question, spoke in regard to it, saying that the superintendent of another Consolidated mill had been trying the practice with very good success and that he too had adopted it. He advocated it strongly. "It probably would not be as necessary on coarse yarn as on the finer numbers," he said, "but do you realize there are hundreds of bands that are failing to put in, by several turns, the amount of twist they are supposed to put in. The yarn is not soft enough to detect, but it is away below standard twist. If we took out two teeth of twist we couldn't run it, and yet we have many bands that are failing by that much at least to put in the required amount. Since we have been doing this we find that the end that used to come down doesn't come down now, when it gets its full amount of twist, and the spinners can run more sides. I am very much a believer in the proposition. We feel of every band, and if you were to do it, you would be surprised at the number that need to come off. Of course, the ideal thing is to have tape drive, but if you have a band drive I recom-

mend that you look into this practice."

"The tape drive needs looking after, too," added Mr. Sord. "We have great difficulty with choked-up idlers on tape drive. I am of Mr. Tatum's opinion about cutting off slack bands. I worked for Mr. Gibson a year, and we went around regularly and cut them off. If you don't get the same amount of twist in all of the yarn the weaver will have a fit when it gets down there to him. I think the bands ought to be looked after once a week, and tape idler cleaned every three months."

"I think that the bands should be gone over and tested," agreed Mr. Smith. "Just before I left Columbus someone was putting out a band tester for this purpose. In a band-driven spindle no doubt you will find the band loaded up with lint which will reduce the twist."

Methods of piecing up after doffing were next discussed, and the socket piece-up and, with feeler, the using of pieces from the weave room, seemed to be the general practice.

Mr. Gibson next brought up the subject of the care and oiling of belts, and asked for specific practices along this line; that is, the kind of belt dressing used, and how often the dressing was done.

One man said he uses a non-adhesive belt dressing, and started out going over them about once a week, but found that he needed it only once every two weeks. He has motor belts over the cards, which are dressed once a week. He stated that they do not clean the belt before oiling.

"I, too, have found that never to 'card' the belt before oiling is best," said Mr. Mooney. "That will scratch the face of the belt. The best thing I know of is to use a piece of rubber—an old tire, or something like that—and you will find that you will use very little dressing. I use a small amount of non-adhesive dressing, which is very good. Too much will gum up the belts. If you will use a piece of rubber in cleaning the belts it acts as a sort of dressing itself; the rubber melts and spreads on the face of the belts."

Called upon for a statement, J. T. Chappell, overseer of weaving, Dallas Cotton Mills, stated that the belts for his department were underneath the floor, running in the basement for the most part where the atmospheric conditions usually were about constant. He said, however, that they grease them about once every two weeks, with a compound of neatsfoot and castor oil. Mr. Cosby, of McKinney, uses this compound also, and added that he does not "card" the belts before greasing.

Mr. Lance, of Hillsboro, stated that he cards the belts and greases once a week, applying the material with a brush. He added that he uses some stick dressing in the card room. Three others present use stick dressing, it was indicated by a show of hands. Mr. Smith said he uses "cling-surface" dressing, applying it hot with a paint brush. He puts it on both the inside and the outside of the belt. Four others indicated they grease the outside of the belt.

One man reported the use of a 50 per cent compound of tallow and castor oil. Another man said he uses pure tallow. Mr. Tatum asked if anyone could give a good method of cleaning belts. Mr. Sord said the best method is to use a piece of rubber to take the dirt off of the belt.

"What is the best method of holding down supplies?" was the final question of the session. "A good system of cleaning and oiling," answered Mr. Brady. "Have men with sense and gumption," said Mr. Poole.

In concluding the session—for the hour was growing late—Mr. Gibson pointed out the fact that twelve men organized the Association in Dallas ten years ago, and called upon one of those men, T. A. Adams, manager of the South Texas Cotton Mills, Brenham, Texas, who was present. Mr. Adams briefly discussed the relationship of manager and superintendent. Mr. Tatum, Mr. Poole and Mr. Gibson were the other men present who were at the organization meeting, and spoke briefly in regard to the growth of the Association since that time.

The closing feature of the evening was a contest to elect the "handsomest" man and the "ugliest" man present. After much merriment the vote was counted, and Mr. Tatum was declared the "ugliest" man, and Mr. Poole the "handsomest." Appropriate prizes were awarded.

The next session of the meeting was opened at 9:30 o'clock on Saturday morning at the Chamber of Commerce. The opening feature was an address by Miss Fay Miller, social service worker at the Sherman (Texas) Manufacturing Company, who discussed social service work and its contribution to production.

Following Miss Miller's talk, practical discussion was resumed, and the first subject considered was

Methods for Holding Down Waste.

Mr. Chappell, when called upon, stated that it was largely a matter of working at it all the time, and of staying in behind it. "The best method I have ever run across," added Mr. Lance, "is to keep check on the waste. Find out where it is made, and weigh it up, and, as far as possible, show every person responsible how much waste he made." Mr. Tatum agreed with Mr. Lance, stating that his idea always has been to put the responsibility upon the individual, starting at the carding department and going all the way through the mill, keeping each operative's waste separately.

As to holding down seconds, the next question, J. O. Wilson, superintendent, Guadalupe Valley Cotton Mills, Cuero, Texas, stated that in the weave room the best thing he had found was to get a good loom fixer. With reference to the percentage of waste, he replied that his percentage runs about 2½ per cent, of which fully two per cent comes from the loom. Mr. Edmiston pointed out that hard size also causes seconds, as well as rust in the size box and pipes, and bad filling, but that he had no figures on his percentages.

"We have a system of keeping a percentage on each loom-fixer's section, as to the production, and number of seconds made, and we find it is a mighty good thing to encourage friendly competition between the fixers," said J. L. Nelson, overseer of weaving, McKinney Texas. On a Draper loom he mentioned the need for keeping the warp stop motion cleaned out well.

"We have the record Mr. Nelson spoke of" added Mr. Tatum, "of keeping a record of what causes seconds and who makes them. The sheet is posted in the weave room every day." In addition, he added, the inspector has a smaller form, and when a defect is encountered, it is marked up and reported to the fixer so that he can remedy it as soon as possible.

Mr. Govier reported contact recently with a mill having an excess of seconds, which was found to be caused from using calcium chloride in size which went into iron pipes. Mr. Tatum pointed out that kettles should be copper-lined, and another man said that brass pipes should be used.

The remainder of the morning session was given over mainly to a discussion of the relationship of the employee

to the overseer and superintendent. The first question discussed was, "Should the superintendent correct or discharge employees?" The unanimous sentiment expressed in the discussion, and summed up briefly, was that it is not proper for the superintendent to discharge employees personally. That it is entirely proper for the superintendent to correct any employee he finds doing defective or improper work; but that when it comes to the actual discharging, the superintendent should inform the overseer and ask him to do the discharging. It was pointed out that should the superintendent go past the overseer and discharge help, the respect of the workers for the overseer is lessened. Both the superintendents and overseers present seemed unanimously agreed that the overseer should do the "hiring and firing."

"What action should the superintendent take when operatives bring him criticism of the overseer?" The meeting seemed agreed that in the usual run of such cases, the superintendent should willingly and patiently give audience to any such criticism or complaint, for overseers, just like operatives and superintendents, are fallible. There was some discussion as to whether the superintendent, after hearing the complaint, should call in the overseer for an explanation in the presence of the complainant. It being pointed out, that should the complaint be justified, an embarrassing situation might easily develop. This proposition, it was brought out, is largely dependent upon the conditions of each individual case. This seemed to be the feeling in connection with several other topics of a similar nature brought up.

The closing feature of the meeting was a delicious luncheon, served in the dining room of the First Methodist Church, at 12:30 o'clock on Saturday. Following the meal, further discussion of human relationships was conducted, participated in by Messrs. Poole, Gibson, Booth, Bagley, Philip, Moore, Tatum, and others. After a brief discussion the election of officers was held with the following results:

President Grover C. Dilling, superintendent, Brazos Valley Cotton Mills, West Texas.

First Vice-President, J. O. Wilson, superintendent, Gaudalupe Valley Cotton Mills, Cuero, Texas.

Second Vice-President, H. G. Edmiston, superintendent, Denison Cotton Mills, Denison, Texas.

Secretary-Treasurer, Dan H. Poole, superintendent, Sherman Manufacturing Company, Sherman, Texas.

Denison, Texas, was selected as the place of the Fall meeting, which will be held sometime in October, 1925.

Each man present was called upon to stand and introduce himself. Following this the meeting was adjourned.

Machine Calico Printing

BY WILLIAM B. NANSON.

Choice of Thickening.

The choice of the particular thickening to employ in a given case is largely a matter of experience and depends upon many things. The style of the engraving and its condition must be considered, the item of cost must be borne in mind, the question of penetration and the sharpness of the impression must be allowed for.

Another important consideration is the ultimate finish to be given to the goods. If they are for a soft finish the thickening must be of such a character that it can be entirely removed from the goods after printing and fixing without injuring the color of the pattern. For this purpose gum Senegal, gum tragacanth and British gum are the best thickenings to use. For stiff finish goods starch thickening is advisable if it also fulfills all other conditions. Coarse engraving requires a thicker color than a delicate shallow engraving, but for blotches or backgrounds the reverse of this obtains—the lightly engraved rollers require the thickest color.

The colors for two "stippled" rollers falling one over the other, may be thickened with starch or gum Senegal. according as the stipple is required to show distinctly or graduate imperceptibly. Sometimes the darker color is thickened with starch and the lighter with gum Senegal, in which case the graduation is distinct, but not too hard.

The best thickening for yielding even "blotches" is gum Senegal or gum arabic, but it cannot be used for dark colors on account of the fact that colors thickened with it wash out a good deal in the soaping, and, if strong, dirty the white ground of the cloth, for dark blotches therefore, tragacanth or tragacanth mixed with starch is the best. A color thickened with gum Senegal or arabic finishes much lighter in shade than one thickened with starch, therefore starch should always be used when at all possible. Strongly alkaline and strongly acid colors are usually thickened with either the natural or the artificial gums, as they act on starchy bodies, and either thicken them too much and make them sticky or decompose them altogether.

There is another thing that we have noted and that is, that the same color does not give the same shade with different thickenings. For example, a color composed of alizarin orange, alizarin yellow, alizarin blue, and acetate of chromium (a fawn color) produces a reddish shade with starch and much yellower and softer shades with tragacanth thickening.

It is therefore seen that, irrespective of depth, the tone of a color is also influenced by its thickening, and therefore thickenings are not always interchangeable without making some alterations in the proportions of the constituents of a mixture of two or more colors.

The order in which the colors of a multicolor pattern are worked in the printing machine also influences the choice of thickening in many cases; notably those of delicate, easily soiled, and sensitive colors like pinks, salmons and terra-cottas, fawns, drabs, and pale blues. In such cases, if it is quite necessary to print these sensitive colors first, it is always advisable to thicken them with gum of some sort, since the "scum" (from the following rollers) on the surface of a "gum color" washes off much more easily (and produces less soiling) than it would, or does, from the surface of a "starch" color.

In a general way the thickening agents given below will be found the most suitable for the styles of work given:

For pale blotches or backgrounds: Gum Senegal or gum arabic, and also British gum.

For dark blotches or backgrounds: Gum tragacanth

alone, or a mixture of tragacanth and starch. When starch alone is used it requires flattening or distributing evenly by passing under a "starch roller," i.e., an unengraved roller working in water or starch paste, and furnished with doctors as usual.

For fine, sharp impressions: Thick color of any thickening may be used, starch and the gums are the best; gum tragacanth is the least desirable.

For stippled work: For crisp impressions and sharply defined shadows use thick color; for obtaining delicate imperceptible graduation, use thin gum Senegal for preference, and in the second place, thin tragacanth or British gum.

When the color is required to penetrate to the back of the cloth, gum tragacanth is one of the best thickenings to use; and after that tapioca starch, wheat starch and flour, all used as thin as possible.

For acid resists, discharges and colors: Gum Senegal or British gum. either with or without China clay. Starch may also be used in many cases.

Alkaline colors, resists and discharges: Gum Senegal, British gum and in some instances corn starch.

For madder styles: Flour and starch singly or mixed together. Flour is especially good for thickening iron and aluminum acetates as a rule, though it is usually mixed with a little starch for this purpose. British gum is also used for light madder "blotches" and "pads."

For pigment colors: Albumen and tragacanth; more rarely albumen and wheat starch.

For soft finish goods such as flannelettes, sateens, etc.; Gum Senegal or gum tragacanth are the best to use where they can be afforded, especially if the pattern contains heavy masses of solid color. Small masses and outlines are better and more economically printed with a starch thickened color. British gum or dextrin is also a good thickening for blotches in these classes of work, and is usually substituted for this high priced Senegal. British gum yields yellower shades of alizarin pink than gum Senegal.

A thickening has come into the market recently called gum tragasol. The writer has no personal knowledge of it but it is claimed to be of the same nature and can be used in place of tragacanth as a thickening. This gum is prepared from the seed of the locust bean, or St. John's bread, the fruit of the carob tree, *ceratonia siliqua.*

Gum tragasol is a stiff, nearly transparent, jelly, and, previous to the addition of carbolic acid which is put in as a preservative it is practically tasteless and odorless. It is perfectly neutral, and although it does not contain either sugar or starch, it is almost a pure carbohydrate.

Tragasol mixes readily with practically all the materials generally used in the thickening of printing colors. It contains a large percentage of water owing to the necessity of its mode of extraction and manufacture, and were it not so, its use would be rendered more difficult owing to its being partially insoluble in water. For most purposes, however, tragasol requires diluting with water to prepare it for use. The best method is as follows: In a suitable mixing tank fitted with stirrers, place a given quantity of the gum. This is agitated for an hour or two until it becomes more elastic in its condition. Cold water may now be run in, very gradually at first, until a quantity equal to the gum has been added, say, 11 gallons of water to 112 pounds of tragasol or a still greater quantity if necessary to get the mixing right. During this operation the gum absorbs the water, and, if properly carried out, it is left, after such dilution in a syrupy smooth condition not unlike thick oil or glycerine.

Generally speaking, the use of this gum lies in the direction of the starches but it also possesses qualities of its own. For thickening, tragasol may be looked upon as an adjunct of the flours and starches as it readily mixes with them. It is also an excellent carrying agent for China clay and pigments which would indicate its value in discharge or resist styles, all in all we think the color maker might investigate it with profit to himself.

Drying.

The physical causes of the defects occasioned by the drying of the pieces after printing arise from excess or deficiency of heat, and the stagnation of the air. The drying must take place as rapidly as possible, in order to prevent the colors from spreading upon the fabric and so spoiling the design; and for this purpose the drying cans are usually heated to 100 degrees F. in order to dry the pieces directly. Care, however, must be taken not to exceed that temperature, which is known by experience to be the best for mordants, especially for the aluminous ones; as by that means the colors might become incrusted, and scale off the fabric, which is particularly the case with those thickened with gum. A less degree of heat is maintained when the pastes contain very strong iron mordants. or steam colors, and especially ground colors, which are the most brilliant the more slowly they are dried.

The air must be renewed as often as possible in the drying rooms, in order to carry off the vapors of water and acid which are driven off the printed pieces; as the former might spoil the design by damping it, and the latter by transforming the mordant into an acetate which would not combine with the fabric, and would therefore produce white spots.

The atmosphere of the printing shop should never be allowed to cool under 65 or 70 degrees F. and should never be allowed to get too dry. Temperature and moisture should therefore be regulated by the aid of thermometers and hygrometers (the wet and dry bulb system) as they exercise a great influence upon all the printing processes, and especially upon the combination of the mordant with the cloth. In the course of the dessication, a portion of the acetic acid evaporates with the water, and subacetates are formed which combine with the goods in proportion as the solvent principle escapes; the water, as it evaporates, carries off acetic acid with it, and thereby aids the fixation of the bases. These remarks are peculiarly appropriate to delicate impressions of the printing machine where both the printing and the drying are rapidly effected. In the lapis lazuli style, the strong mordants are apt to produce patches, being thickened with China clay and gum, which obstruct the evaporation of the acids. They are therefore apt to remain, and to dissolve a portion of the mordants at their immersion in the blue vat, or at any rate in the dung bath. In such a case a hot and humid air is indispensable after the application of the mordant, and sometimes the goods so impregnated must be suspended in a damp chamber. To prevent the resist pastes becoming rapidly crusty, substances apparently useless are mixed with them, but which act beneficially by their hygrometric qualities, in retarding dessication. Oil is sometimes added with that view.

It is often observed that goods printed upon the same day, and with the same mordant, exhibit inequalities in their tints. Sometimes the color is strong and decided in one part of the piece, while it is dull and meagre in another. The latter has been printed in too dry an atmosphere. In such circumstances a neutral mordant answers best, especially if the goods be dried in a hot air chamber, through which humid vapors are in constant circulation.

A certain degree of humidity which may be known by experience and which can be ascertained by means of the wet and dry bulb hygrometer is indispensable to the union of the mordants with the fabric, particularly when they have a base of iron, tin, iron and alumina, tin and aluminum or aluminum alone. The action of the air upon the fabrics while drying and ageing is chemical, although produced by physical causes: in effect, the damp air penetrates the stratum of color, softens it and carries off the acetic acid of the mordant, leaving the alumina, iron, etc., with which it was chemically combined but not yet in combination with the fabric, as it only combines therewith by a suitable degumming operation (or dunging operation as it is sometimes called) without which only dull and feeble colors are produced.

Let us take for instance what is known as the "mordant style" of printing upon which the color is afterward dyed; this style was at one time the most extensively practiced of all classes of work and is so still where the fastest colors are required. This mordant style may be divided into two branches, viz., the madder style, and the printing of other mordants such as chrome, tannic acid, b-naphthol, etc. In the madder style the only mordants used are those of alumina and iron. Aluminum alone yields various shades of red and pink when dyed up in alizarine (synthetic madder). Iron alone yields with the same dyestuff shades varying from black to the palest lavender. Iron and aluminum mordants in combination yield colors ranging in shade from claret through all graduations of bordeaux and maroon to the deepest chocolates, according to which of the two mordants predominates in the mixture. Browns and allied colors may be dyed on the same mordants with either nitro-alizarin alone or with alizarine itself mixed with dyewood extracts, logwood, Persian berry or quercitron bark, etc.

Both aluminum and iron mordants consist of the acetates of their respective metals; in both cases the crude acetates are the best. The following points must be carefully observed in the printing of mordant colors: (1) After printing the cloth must be gently dried otherwise the mordant will become dehydrated or "burnt" and instead of dyeing up evenly they will appear patchy and very light in the overdried parts; (2) the dyestuff must not be used in excess; and (3) the temperature of the dyebath must be kept as low as is consistent with the fixation of the color. If these last two points are neglected the unprinted parts of the cloth, which should remain a pure white when it is finished, will be soiled beyond repair unless the whites are cleared at the expense of the color. The red liquors vary considerably in composition, some being normal acetates, others basic acetates, some normal sulphate acetates, others basic sulphate acetates, but their mode of application is the same always, that is, they are thickened, printed, aged and dyed in alizarine.

Iron mordants are liable to unevenness due to oxidation being too rapid; and as this defect is most noticeable in purples and lavenders, the black iron liquor is frequently boiled for half an hour or more with one per cent of its weight of arsenious acid which tends to retard its oxidation. For this purpose the goods are printed with either aluminum or iron mordants, and hung or "aged" for two days in a brick chamber containing moist air at about 30 degrees Centigrade dry bulb, and 27 degrees Centigrade wet bulb thermometer.

In this operation the "ageing" which is really volatilization of the acetic acid leaving the hydrated oxide on the fiber, goes on slowly and evenly. After hanging, the last traces of acid are removed and the hydroxide thoroughly fixed by "dunging," a process by which the goods are passed through a mixture of cow dung and chalk at a temperature of about 50 degrees C. In this dunging bath they are worked altogether about 1½ hours, at the end of which the mordants are thoroughly fixed and all the thickening agents perfectly eliminated, thus leaving the cloth in the best condition to absorb the dyestuff. The dyeing is carried out by working the goods at 60 degrees C. in a mixture of alizarine, a little chalk, and glue size for 1 to 1½ hours. They are then well washed, soaped and the whites cleaned by a passage through a weak bleaching powder solution, followed by a passage through steam. Further soaping and washing is then resorted to until the goods are quite clear and bright.

In the case of cloth printed in red and pink alone the goods, after dyeing, are well washed, passed through a bath of alizarine oil containing oxalate of ammonia, and then steamed for one hour at 15 pounds pressure. This brightens the color by removing the brown appearance they possess after dyeing. When reds or pinks are printed with chocolates or purples, however, the oiling process must be carefully conducted, otherwise the two latter colors suffer; frequently the oiling is omitted altogether, the brightening being then effected by a vigorous soaping.

By printing the following mordants a six-color design may be produced with a single dyestuff and in one dyeing:

	Red	Pink	Chocolate	Dark Purple	Violet	Black
Aluminum ace- 6 deg. Tw.	12 gals.	3 gals.	10½ gals.			
Black liquor, 24 deg. Tw.			1½ gals.	1 gal.	½ gal.	8 gals.
Water		8 gals.		11 gals.	11½ gals.	4 gals.
British gum		36 lbs.			36 lbs.	
Acetic acid		1 gal.				
Tin crystals	1½ lbs.	¾ lb.				
Cottonseed oil	¼ gal.		¼ gal.	¼ gal.		¼ gal.
Starch	16 lbs.		16 lbs.	16 lbs.		16 lbs.

The foregoing mordants are printed on white bleached cloth, dried, hung for two to three days, "dunged," dyed, washed and well soaped and washed again, chemicked through a weak bleaching powder solution, and finished.

The dunging is performed in vats through which the cloth is drawn continually during the operation. As a rule dunging is done twice, the second bath being weaker than the first. The vats or dung boxes contain a mixture of:

FIRST DUNGING.

Water	100 gallons
Chalk	10 pounds
Cow dung	50 pounds
	at 60 degrees C.

SECOND DUNGING.

Water	100 gallons
Chalk	5 pounds
Cow dung	25 pounds
	at 60 degrees C.

Wash well after dunging and dye in alizarine. The

dyeing is carried out usually in rope form in a dyebeck. The beck is charged according to the amount of space covered by the pattern on the cloth, if, for instance, half the surface of the cloth is printed, then the dye liquor might be made up as follows, the quantities being calculated on the weight of the cloth:

4½ per cent alizarine (blue shade) 20 per cent
1½ per cent acetate of lime, 28 degrees Tw.
10 per cent glue solution, or size (15 per cent)
(In sufficient water)

The goods are entered into this solution cold. The temperature is gradually raised to 60 degrees Centigrade, and the dyeing continued at this for one hour or more. The goods are then washed, soaped, cleared and finished, etc.

Aniline black may be printed along with red and iron liquor and many other modifications are also employed, but the principle of dyeing is always the same.

The Printing of Other Mordants.

Of these the most important are tannic acid, chrome mordants, and b-naphthol. For printing tannic acid the following is used: Five pounds tannic acid dissolved in one gallon acetic acid and added to nine gallons of starch and tragacanth paste. The goods are simply dried after printing and the tannic acid immediately fixed by passing through a solution of: two ounces tartar emetic, one ounce chalk, and one gallon water at 60 degrees Centigrade. After washing they may be dyed up in any of the basic aniline colors.

Various chrome mordants are employed in printing, among which may be mentioned chromium chromate and chromium acetate. The former is thickened with starch or gum, printed and fixed by being passed through boiling sodium carbonate. The latter is applied in the same way, but after printing is steamed before the carbonate treatment. Both these mordants are suitable for dyeing with any of the dyes mentioned later under the direct printing of mordant colors such as alizarine, alizarine bordeaux, coeruline, and the natural dyewood extracts. They are dyed similarly to the madder styles, with the addition of glue size to preserve the white of the unprinted part of the cloth.

Direct Printing.

This is the style of printing largely used today in place of the madder style which we have just discussed. This direct printing style, though not so fast as the madder style, is capable of application to almost every class of color known. Its essential feature is that the coloring matter and its fixing agent or mordant are both applied to the fabric simultaneously. In some instances the fabric requires to be previously prepared for certain of the colors used along with those characteristic of the process, but this is one of many cases where two styles are combined, and it must be classed with the one which it most resembles.

Direct printing mordant colors include both artificial and natural dyestuffs, the most important of all being alizarine, an artificial preparation resembling the coloring principle of the madder root and derived from anthracene, a coal tar product. With different metallic oxides alizarin forms different color lakes all exceedingly fast to light and soap. Aluminum mordants give red and pink lakes, iron mordants give purples and lavender; chromium yields maroons; and uranium gives grey shades. Mixture of iron and aluminum produces various tones of chocolate and brown.

In addition to alizarine the following are a few of the more important mordant dyestuffs employed in textile printing: Alizarine orange with aluminum and chrome mordants for orange and warm brown shades respectively, alizarine bordeaux with alumina for violets; alizarine blue, with chrome and zinc for quiet blue shades; coeruline and alizarine viridine for greens and olives with chromium mordants; gallocyanine, chrome violet blue, alizarine cyanines, etc., with chromium for various shades of blue and violet; alizarine yellows and anthracene brown for yellow and fawn shades respectively with either aluminum or chromium mordants. The natural dyestuffs belonging to this series are chiefly, logwood with chromium and iron mordants, for blacks. Persian berries and quercitron bark, with aluminum, tin and chromium mordants, for colors ranging from brilliant yellow to quiet old golds and browns; catechu with chromium for very fast dark browns; and occasionally in mixtures, sapon wood, peach wood, Brazil wood, and divi divi extracts with any of the above mentioned mordants.

The mordants are mostly in the form of acetates, which are stable in the cold but which decompose during the steaming process, and combine as hydroxides with the colors, forming and fixing on the fabric the insoluble lake.

Alizarine reds and pinks are the most complicated of the mordant colors, requiring for their proper production the addition of brightening agents, such as oxalate of tin, tartaric acid and also acetate of lime. This also applies to alizarine orange but all the other colors are very simple to compound and are stable for a long time after making. Reds, pinks and oranges are best prepared freshly each day, as their constituents are liable to combine if the color stands 24 hours before using. The following types of recipes will give some idea of the way in which these colors are mixed:

Red.

6½ gallons thick starch and tragacanth paste
1¼ gallons alizarine (20 per cent commercial paste)
1 gallon nitrate of alumina 18 degrees Tw.
½ gallon acetate of lime 28 degrees Tw.
¼ gallon oxalate of tin 10 degrees Tw.
½ gallon 10 per cent solution of tartaric acid.

For reds and pinks the nitrate, sulphocyanide and citrate of alumina are generally preferred in practice to the acetate though the latter is also largely used. Oranges from alizarine orange are made in the same way.

(This is the seventh of a series of articles on this subject by Mr. Nanson. The eighth will appear in an early issue.—The Editor.)

The American Scrubbing Equipment Company, Hannibal, Missouri, have changed their name to Finnell System, Inc., effective April 1st. This change, the announcement states, was made for the same reason that many other well known firms within the last few years have changed the name of their firms to conform to the name of their advertised product—being, in this case, the Finnell system of electric scrubbing, etc. The present sales manager and other officers and executives of Finnell System, Inc., are the same as those who held similar positions with the American Scrubbing Equipment Company.

Human Relationships in Industry

BY W. M. McLAURINE.

Safety and Accidents.

This subject is one of supreme importance in any industry, as it has to do with the conserving of human life, and making for happiness. It makes for greater efficiency in production also, and often this is regarded as the chief reason for a study of Safety and Accidents. I have placed as of prime importance conserving human energies and life, and second the conserving of pecuniary substances.

To delve immediately into the subject, we ask, "What is an accident? Can accidents be classified as avoidable and unavoidable?" Webster says an accident is "an event which is unexpected, or the cause of which was unforeseen; a contingency, casualty, or mishap; a property of a thing which is not essential to it."

A contingency means "a possible occurrence." A casualty means "an accident resulting in bodily injury or death." A mishap means "something that happened wrong." Taking all of these definitions now as copied from the dictionary, let us gather them into a single sentence. An *accident is something, unexpected, unforeseen, resulting in bodily harm or death, something that happened wrong, a possible occurrence.*

Taking these definitions into consideration we ask the second question, "Can accidents be classified as avoidable and unavoidable?" From the hasty and hurried reaction on the part of the group will come the reply, "Surely, there are accidents that can not be avoided."

But let's go one step further, and ask, "Is there any accident that can not be traced finally to some human responsibility?" As the law of the land sets forth "acts of Providence are omitted," and yet I am not inclined to omit all acts attributed to Providence.

There are so many things that just happen, as we are accustomed to say, no one is responsible and to be sure, if there is responsibility, we are not to blame.

I had this case to come up in a conference last year. In a warehouse, a hoisting chain used in the lifting and stacking of cotton broke and a man was hurt. In discussing the case several of the group were inclined to say it was unavoidable and could not have been prevented. No one was to blame. No one knew the chain would break. One had never broken before. This chain had been used to lift heavier bales, etc.

Suppose you discuss this case with the different angles it presents.

Another accident that happened recently and within my observation. Excavation was being made for a large building. The excavation was not deep or apparently dangerous, as far as caving in was concerned. A few feet from the side walls, small pits were being dug for pillars or central supports. Several laborers were down in them. The main wall crumbled and filled the pit and killed two of the laborers.

Was the accident avoidable? The vibrations of traffic on the street seemed to have caused the crumbling. Who was to blame? The following cases will suggest to you two great heads as causes for accidents: ignorance and carelessness. Suppose as you discuss the cases you try to decide what kind of ignorance it was, and what kind of carelessness, the causes for these, the costs, and the way such defects may be overcome.

The cases follow:

1. A workman is oiling the gears on an all geared head lathe using a long spout oil can. The spout gets caught and is smashed. The workman, while the lathe is still running, reaches his hand into the gears to see what caused the spout to get caught, and loses a finger. What are the foreman's responsibilities for the prevention of such accidents?

2. A pearl button factory has provided a system for feeding a stream of water upon the shells while the blank buttons are being cut. This is intended to keep down dust, but in spite of the system a large percentage of the cutters, who remain long on the job, contract tuberculosis. If the cutter foreman has responsibilities in a case of this kind, what are they?

3. An apprentice, before he has had proper training in running a lathe is "turned loose" on it. Through his lack of knowledge he forgets to throw off the automatic feed and the carriage runs into the head stock and strips the gears.

   a. Is the foreman responsible for this accident?
   b. Should the apprentice be held responsible for cost of repairs?
   c. Should the foreman?

4. On his last trip, the factory inspector has instructed the foreman to see to it that the gears on a certain machine are guarded. He has neglected to do so and a man is injured. How would you, as general foreman, handle this case?

5. Suppose that in a certain shop it is dangerous to start any machine until general switch number 25 has been thrown. Would you put up a large general sign stating, "Do not start any machine until you throw switch 25," or would some other method of warning be better? Why?

6. Jones is out late playing penny ante. The next morning he is very much asleep on the job. As a result he forgets to oil the motor. Resulting from this, the bearings are burned out and the plant has to shut down for one-half day. If you were foreman, how would you handle this case?

7. An oiler in a cotton mill after oiling a low overhead shaft left off the housing on a large horizontal belt. A woman passing under the belt had her hair caught in the belt and died as a result of her injuries. Cause?

8. A man employed on the yard train crew in shunting cars by gravity down an incline has to duck a large overhead beam. He ducked this beam for two years and was considered a good man on the job. One evening he neglected to duck and was knocked off the car he was braking. Cause? Responsibility? How could it be remedied?

9. The brakeman who invented the overhead bridge warning jolter was himself killed by being struck by an overhead bridge after being touched by the jolter. Cause?

10. A woman spinner in a cotton mill was in the habit of starting her frame when the belt was slack by pushing against the belt with a stick. She had been warned to stop this practice and to report to the overseer when belt was slack. One day while using the stick a belt stud caught the stick and she fell into the belt tearing open her face. Cause?

11. A large belt furnishing power to an elevator from the main line shaft of the mill came off the pulley. The elevator man was afraid to put on the belt with the pulley running. The foreman tried to put it on for him, and in doing so caught his hand between the belt and the pulley and had his arm torn off at the elbow. Cause?

12. The accident curve shows the following peaks: Highest toward closing time; next highest after lunch; next highest shortly after starting in the morning. Cause?

13. A new guaranteed and tested cable of a mine hoist breaks. Cause?

14. A railroad brakeman incapacitated for following railroading, gets a job running a small hand-feed punch press. Within a few minutes he punches a hole through his hand. Cause?

15. A bank in which many workmen have their savings deposited fails. A number of minor accidents occur in the plant shortly after this news is received. Cause?

16. A good loom fixer who had been warned not to do so, persisted in carrying an open knife in his jumper pocket. In idle time he was in the habit of scuffling with any one passing by, and on one occasion he ripped open the arm of a weaver with whom he was scuffling. Cause? How would you have handled this man?

17. A picker operative attempted to remove some cotton wrapped around a beater shaft, the beater knocks his fingers off, the cotton then slips from his grasp and is sucked into the beater. The operative grabs at the cotton and had his arm cut off. Cause?

18. An operative after having his fingers caught in the gears of his frame was explaining to the overseer how it happened, and while doing so another finger was caught and torn off. How would you classify this accident?

19. The gears on a roving frame were so covered with lint that they could not be seen. Operative has his fingers mashed. Cause?

20. A master mechanic while attempting to locate trouble in a cutting motor grasps the motor frame with one hand and a water pipe with the other. The motor is not properly insulated and the master mechanic is killed. How would you classify this accident?

21. Truck man in weave room to avoid hitting looms habitually pays attention only to the side of the truck nearest the looms and on one occasion knocked down a weaver. Cause? How would you handle this?

22. A weaver on night shift spears a June-bug on a reed hook and touches the fly to the electric power switch. The weaver is knocked out and the room shut down. How would you classify this accident?

The information derived from the discussion of the cases given and the cases brought forward by the group should have been tabulated under three heads as indicated in the following lists:

I. Causes:

1. Responsibilities of overseer, superintendent, etc., (in part).
   a—Poor hiring policy.
   b—Bad judgment in placement.
   c—Bad mill layout.
   d—Too many hazards.
   e—Poor instruction.
   f—No safety program or ineffective safety program.
   g—Poor class of employees.
   h—Poor supervision.
   i—Overload and underload of some employees.
   j—Poor cooperation.
2. Responsibilities of help, (in part). (The information here recorded was developed from a discussion of the cases entirely.)
   a—Lack of information—ignorance.
   b—Negligence.
   c—Forgetfulness.
   d—Familiarity with hazard.
   e—Disobedience.
   f—Overconfidence.
   g—Haste.
   h—Overload.
   i—Unfamiliarity with job.
   j—Mental distress.
   k—Attempting to prevent injury to others.
   l—Disregard of safety requirements.
   m—Physical defect—bad eyesight—hearing, etc.
   n—Lack of judgment.
   o—Lack of care of machine.
   p—Mischievous.
   q—Poor equipment.
   r—Experimenting.
   s—Snap judgment.
   t—Impulsive action.

The causes listed are not intended to be complete or clearly marked from a psychological division of mental states. These causes and others that may be developed in your discussion may be properly classified with three main headings as follows:

II. Causes classified:

1. Ignorance:
   a—Lack of information.
   b—Overconfidence.
   c—Ignorance as to hazard.
   d—Ignorance of physical condition.
   e—Unfamiliarity with job.
   f—Ignorance as to care of machine.
   g—Poor judgment.
   h—Unable to understand safety rules and regulations.
   i—Disobedience (unintentional).
2. Carelessness:
   a—Forgetfulness and negligence.
   b—Familiarity with hazard.
   c—Disobedience (careless).
   d—Mental distress.
   e—Physical condition.
   f—Poor equipment or condition of equipment.
   g—Disregard of warning.
   h—Absentmindedness.
   i—Attention to major hazard only.
   j—Failure to read rules of safety.

3. Personal Characteristics:
   a—Impulsive nature.
   b—Reckless disposition.
   c—Experimenting.
   d—Craving excitement.
   e—Practical joker.
   f—Revengeful disposition.
   g—"Smart Alec."
   h—The man who knows it all.
   i—Fatalists.
   j—Goes to pieces under excitment.

III. Costs of Accidents:
1. Man:
   a—Human suffering and possibily human life.
   b—Total or temporary loss of earning power.
   c—Suffering and loss to those dependent upon injured.
   d—Reduced earnings.
   e—Loss of time.
   f—Total or partial dependency.
2. Other Workers:
   a—Makes other accidents likely.
   b—Destroys cooperation.
   c—Makes help dissatisfied.
   d—Possibly decreases earnings of workers.
3. Company:
   a—Loss of production.
   b—Bad reputation.
   c—Increased cost.
   d—Increased Compensation Insurance Rate.
   e—Makes damage suits and legal action possible.
   f—Makes it difficult to secure help.
   g—Increases labor turnover.
   h—Loss of possible good employee.

The foregoing suggest some of the possible costs to the man, other workers, and the company. All are involved and all must pay the price for accidents whether they are conscious of it or not.

Although this material, so far, has been given in outline form, it is not advisable for the conference leader to insist upon it until all points are developed. Then if he so desires he can indicate his main headings and have the group to classify its findings.

Before entering into a somewhat detailed discussion of some of the remedies that may be applied in attempting to increase the safety of workers, it may not be amiss to record a few remarks here. So many people who discuss this problem remark, "Oh, well, accidents are just going to happen, no matter what you do or say, they will simply happen." There is another group which is closely allied to this group, and we may term them "fatalists."

Heady, high-minded and foolish, they flirt with death, expose themselves and their fellow workers, disregard instructions and warnings, with the reply, "I am not going until my time, and when that comes, I am going anyway, so why worry—and what is true for me is true for everyone else."

The "Good Book" says, that the things we look for most, are the things that happen, so if we are always looking for accidents to happen, they will surely continue, again, if we do nothing to prevent their happening and think they are fated to happen as they do, they will continue. If I may be pardoned for stating my humble opinion, I believe that accidents are unnecessary, and can be practically eliminated, if not entirely eliminated from any organization. Theoretically, I know they can, but in practice, it is dependent upon so many human agencies that its execution may be said to be possible only. I can make this statement without fear of contradiction. In practically every industry accidents can be reduced and safety, sanity and society demand that they shall be reduced. If the industries or those who are in charge of them will not of their own humanitarian and altruistic efforts do so, society in the form of legal action will place its authority on them. Already there are some such laws on the statute books of every state, and if more are not written it will be because industry has made it unnecessary.

In discussing remedies to be applied in securing greater safety, the following remedies were suggested. If the reader will refer to Section I under "Causes," he will see that effective measures all lie within the realm of the overseer, etc.

IV. Remedies to be applied in trying to secure greater safety:
1. Overseers, etc.
   a—A more careful hiring policy.
   b—A more careful placement policy.
   c—A better mill layout.
   d—Safety appliances.
   e—Instruction: (a) Arouse the mind of worker to its thinking level. (b) Instruct him in safety rules and regulation. (c) Instruct him in their application. (d) Instruct him what to do in case of accident. (e) Instruct him with regard to safety of others. (f) Test him out under a trying situation, if possible. (g) See whether his head and hand work together. (h) Instruct him in the various costs that result. (i) Study accidents and accident prevention with him. (j) Probable results of accident. (k) Instruct him on care of machine and what results may be expected from improper care. (l) Show him hazards to be guarded against.
   f—Safety Program. (a) Get program of Insurance Carrier and follow its details until accepted by Company. (b) Make out a safety program and follow it rigidly. (c) Get the cooperation of all employees. (d) Offer rewards to departments for safety. (e) Follow the instructions of insurance carrier. (f) See that signs and cards are placed conspicuously. (g) Have a suggestion box.
   g—Develop Employee. (a) Take care in hiring and get people who are responsible and have "heads." (b) Don't let them work with their hands only. (c) Keep minds active.
   h—Give Better Supervision. (a) While authority is, and should be distributed, responsibility for authority can not. (b) Don't expect everything from the fellow beneath you. You are in executive position because you are regarded as better fitted for the position. Give it. (c) Study people, machines, probable accidents. (d) Transfer when necessary. (e) Instruct, warn, repri-

mand—suspend—discharge, as your best judgment indicates. (f) Be sure you locate responsibility for accident before you take any drastic action. (g) Study physical and mental condition of your workers and try to devise means of keeping them in good condition.

i—Distribution of Labor. (a) The man overloaded may cause an accident from fatigue or haste. (b) The man underloaded may cause an accident by interfering with others, practical joking, experimenting, weariness because of not having time occupied, etc. (c) Work may be not harmoniously distributed. The worker may be required to do two widely different jobs in his daily routine, and monotony or inattention may cause him to make a mistake.

k—Cooperation in Safety. (a) An automobile may be properly equipped with all of the component parts necessary for a high classed, efficient car, but if the engine is not properly timed, and all parts work together for the accomplishing of the one result for which it was created, the whole machine is no good. This is a figurative statement of what I mean by *cooperation* in a safety program. Everybody acting together and working toward the same end.

The suggestive outlines given thus far are capable of a further development and must be so regarded. They may look formidable and theoretical and of little value. They are made of material that was gathered in the field from practical men, and not one sentence, so far, has been taken from a text. An intensive study in detail is sure to develop a line of thinking that will produce beneficial results.

Some statements now follow that are the results of statistics and observations:

1. Men employed less than thirty days are hurt six times as often as those employed longer.

2. Those that are employed less than six months are hurt four times as often as those employed longer.

3. Those employed for an unusually long period of time, who become automatic in their thinking and acting, form another group for potential accidents.

4. Thus it can be said, that the new worker, who knows little about his job, or the old worker who knows all about his job, and hence is automatic, furnish the great field for accidents.

5. Analysis of lost time from accidents in the cotton spinning and weaving industry, shows that 35 per cent of time lost was due to mechanical causes and 65 per cent was due to non-mechanical causes. Handling materials caused 22 per cent, and falls caused nearly 20 per cent.

6. In other words, 65 per cent of time lost was due entirely to the human element without any question. A detailed study was not available, but it is perfectly reasonable to assume that a part of the 35 per cent of mechanical causes was due to the human element.

7. Accident frequency is seasonal, from a yearly study and from the day study, shows that early morn, ten to eleven a.m., three to four p.m., are the high peaks. Why?

8. A further study reveals the fact that accident frequency is highest among low wage earners.

L. Hartley, in his study of "Accidents and Safety," states that in a certain group of industries their accident insurance rates were reduced 85 per cent and offers the following method of accomplishing it. The figures opposite each indicate the rating value, "100" being the perfect score.

I.	Organization:	
	1. Attitude and personal work of those in authority	30
	2. Safety Committee	20
	3. Inspection, not by committee	5
		55
II.	Education:	
	1. Instruction to employee	12
	2. Bonus and prizes	8
	3. Talks by superintendent and others	3
	4. Signs	2
		25
III.	Safety Guarding:	
	1. Safety devices	12
	2. Lighting devices	5
	3. Cleanliness and order	3
		20
		100

The overseer must be a man of clear and concise judgment. He must enjoy the confidence and respect of his men. He must realize that the plant wants every employee to have every dollar of compensation that he is *justly* entitled to. He must be an active judge of equity and justice. He must keep an accurate record and report of every accident, major and minor. He must see that it is properly taken care of in record and report. There must be no malingering. In many cases people either magnify their injury, or are indifferent to it. Both attitudes are bad. The overseer is the key to the situation, and he, in a large measure, is the key-man who raises or lowers the rate. A man with a scratch or cut may regard it as insignificant. Infection may be costly in many ways. A few minutes to have it sterilized and dressed would have made him able to return to work and relieved any hazard.

Again, this same person with scratch or cut may be advised to stay out and not report until days have elapsed and medical bills accumulated at a great cost to all concerned. This is used only for illustration.

The foreman or overseer is the man whose judgment is of value here.

The idea of getting something for nothing is a fallacy—we pay for what we get. This is a law as infallible as the course of the sun. It can be said in the reverse. We get what we pay for.

The idea that it does not cost anyone but the insurance company is entirely in error.

The insurance company or carrier is the only one that it does not cost.

The total accident cost or amount of money paid to the employee, plus the overhead expense, plus the probable ac-

cident hazard regulates the compensative rate. The carrier then calls upon the plant to pay for this amount, and this in turn reduces the earnings of the plant. The earnings of the plant determine its success or failure, and may in turn affect the wages of the employees as a whole.

I know of no better way to conclude this article than suggest that various members of the group recall certain accidents that have happened within their experience, and project them for the group to discuss, as to their causes, costs and remedy.

The second practical suggestion is, that each member of the group shall make a careful inspection of his department, in the mill lay-out, machine hazards, other possible hazards, and general attitude of the workers of his department toward accidents.

This should be made in the form of a report, and each report should be discussed in detail.

A third practical suggestion is, that the superintendent and each one of the overseers should take some subject in line with accidents and safety and outline a ten minute talk on it.

Such subjects as, "Slick Floors," "Pulleys and Belts," "Operating Elevators," "Pushing Bobbin Boxes," "Practical Jokes," etc.

These are only a few of the headings that will probably suggest themselves to the group.

It must be borne in mind that discussion is a good thing, but action in both mind and body is necessary to reduce accidents.

The annual statement to shareholders of the American Cellulose & Chemical Manufacturing Co., Ltd., with executive offices at 15 East 26th St., New York City, says: "You were advised last year that your company was proceeding with an extensive building program to increase the capacity of the Cumberland, Maryland, factory. Your directors are pleased to report that the plant was substantially completed and brought into production during the latter part of 1924. The usual difficulties in starting up such a plant were not encountered due, in a large measure, to the staff and to the technical experts engaged from England, to whom the thanks of the company are due for the energy and zeal displayed. The excellent operating results obtained today have proved that your factory is a most efficient one. The production has steadily increased from day to day and it is expected that the plant will be in full operation by the coming mid-summer. The rate of increase in production depends largely upon the speed with which local labor can be trained for spinning and textile work, and so far the results have been most gratifying." Dr. Camille Dreyfus is president of the company.

To correct possible erroneous reports, the Shambow Shuttle Company have announced that, while they are moving the spool plant from Greenville to Woonsocket, they are not moving their entire southern office and warehouse from Greenville. A warehouse will be retained in Greenville, storing stocks of shuttles for southern mills, as well as a shuttle repair shop with shuttle repair men to do emergency work. When located at Woonsocket, the spool plant will manufacture fibre-head silk spools for the silk trade only.

INTANGIBLES IN MANUFACTURING

A Series by

Frederick H. McDonald.

Familiarity Breeds Tolerance—and Blindness

The more we associate and live with a given situation, plant, or process.

The less capable we are of analyzing its defects.

The coma of accustomed usage breeds in us a laxity of perception that blinds us to the existence of, sometimes, the most palpable needs.

A machine may be old, out of style and difficult to keep in production—but we get so used to battling with it that we never think to compare the benefits that might result in even the extra cost of a new one.

Dark alleys and a maze of round-about methods of internal transportation, processes, and systems grow stealthily into a crazy-quilt scheme of production—and because we are used to them, we tread them blindly, and expensively.

Poor ventilation, dirt, bad light, health-losing conditions of sanitation—all may be an accepted part of our plant's condition merely because we are used to them, and lack the realization of their costliness that would surely come were we suddenly to perceive them as strangers.

Hence the value of the outside viewpoint.

The manager of one plant can tell more about the rotten faults of another's than he could discover in his own—which might be even worse.

Engineers, accountants, casual visitors—the skilled and unskilled—in the keenness of perception of first contact, can be veritable mines of helpful suggestion—

Even though you've "been in the business a quarter-century, b'gosh!"

The Bureau of Standards wishes to announce the publication of Technologic Paper 278, "Effect of Twist on the Physical Properties of a Number 7s Yarn," by F. R. McGowan, Charles W. Schoffstall, and A. A. Mercier. Official distribution is restricted to public service libraries, technical journals, and cooperating experts who cooperate in the work. Others may purchase the publications from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 10 cents.

This investigation was made to determine the most suitable twist for manufacturing the yarn to be used in the Pima post office bag investigation. Data were obtained on the relation of the twist to the breaking strength, diameter of the yarn, yarn count, contraction, and angle of twist. While these data were not sufficiently extensive to attempt to fix definite formula for these relations, it is thought that the tabular and graphical relation studied in this investigation will be useful for the cotton manufacturer. The most suitable twist for the yarn to be used in the Pima mail bags was found to be about 12 turns per inch.

The Mineral Colors

BY JOHN BROADBENT.

The mineral colors are still largely used; and it may be as well to state what they are and how they all may be produced on cotton. The fastness, at least to sunlight, and many of them to washing, is most remarkable, and the cost of their production is set at a low figure. They impart weight to cotton goods, which weight cannot be obtained by dyeing with the coal tar dyestuffs. The principal colors still dyed with the natural minerals are Prussian Blue, Iron Buff, Khaki, Chrome Orange, Chrome Green, Chrome Yellow and Manganese Bronze.

Prussian blue is largely dyed on wool, though in cotton dyeing the basic dyestuffs have already replaced it. The easiest way of dyeing Prussian blue on cotton is to just dye the cloth (or yarn) iron buff. To develop the color the goods may next be passed through a cold solution of ferrocyanide of potash two parts, made sour by sulphuric acid at 168 degrees Tw., or one part. It is possible to get purpler shades of blue by padding the goods in a solution of nitrate of iron at 5 degrees to 6 degrees Tw., with the addition of 2 to 3 per cent of stannous chloride. The temperature of the padding liquor should be 68 degrees to 85 degrees C. A cold solution of potassium ferrocyanide 4 parts, and sulphuric acid (168 degrees Tw.) 2 to 3 parts is applied to the goods, which are then washed and dried.

Logwood extract or methyl violet may be used also as a topping to this Prussian blue.

Prussian blue is easily discharged by alkaline and by boiling soap solutions. It is fast to light and acids. It fades if exposed for a long period to sunlight, but keeping the goods in the dark will restore the color.

For sky blue or Prussian blue the goods should be bleached (except on heavy goods for dark navy, they may be dyed in gray) first, then take to a tub of cold water (we are speaking of yarns) sufficiently to work the goods in easily, add one-half pint of nitrate of iron liquor, work in this for 20 minutes; wring out and pass through one tub of clean water. Into another tub of clean cold water add four ounces of yellow prussiate of potash in solution, and about one-half part of sulphuric acid; work the goods in this for 15 minutes; wring out and wash through cold water in which is dissolved one ounce of alum; wring out and dry.

To dye brighter and darker shades of blue use more or less of the iron and yellow prussiate; or should the shade be too light after passing through the operation described, by repeating the operations through the same tubs, only adding an ounce more yellow prussiate, the shade will be nearly double. There are a variety of blues with peculiar tints such as reddish or purple hue, or greenish tint which were popular under certain designations, such as Mazarine blue, Waterloo blue, Napoleon blue, etc. The mode of dyeing them remains the same, but they have been rechristened with some more popular names. Royal blue, for instance, is dyed as follows: Two pints of iron liquor, one pint of muriatic acid, four ounces of tin crystals. The prussiate tub is made up by dissolving in it one pound of prussiate of potash (yellow) half a pint each of sulphuric and muriatic acid—if not sufficiently dark—repeat.

A dark navy blue is got by dyeing dark slate as by sumac first, then dyeing royal blue, then topping, dry, with a plum tub.

A green is made by dyeing a yellow (preferably a chrome yellow) on top of the Prussian blue.

Silk and woolen goods can be worked into any shade of blue by using muriate of iron and tin and *red* prussiate in place of yellow prussiate for cotton.

Iron buff is a color that has been used from the very earliest times. It has been found among the mummy bandages of Egypt and the color has been found, even when at that remote age, quite good and fast, and the large amount of lime found in these bandages have shown us that the iron salt has been precipitated by lime. Iron buff is still very extensively used on cotton dyeing. It usually consists of hydrated ferric oxide, which may be produced on the fiber by one of the following methods: The goods may be impregnated by a ferrous salt: Ferrous acetate (pyroligniteº of iron) $Fe(C_2H_3O_2)_2 + 4H_2O$. This is prepared by dissolving iron in pyroligneus acid, or by double decomposition of ferrous sulphate and crude calcium acetate. The impurities found in this iron, which is the commercial product, is ferrous and ferric sulphate and an excess of acetic acid.

As a mordant for alizarine ferrous acetate is largely used, it is also used as a black mordant for the production of black with logwood and iron buffs and khaki colors. Ferrous sulphate is made from copperas, $Fe\,SO_4 + 7H_2O$. The impurities in this are alumina, zinc, free acid and copper. Ferrous sulphate is readily soluble in water and is used as a reducing agent in indgo dyeing, in the dyeing of grays and blacks, in the fixing of tannin mordants and for the production of various iron mordants.

Ferric nitrate $Fe_2(NO_3)_6$ is prepared by dissolving iron in nitric acid and is used for dyeing iron buff and Prussian blue. Ferric sulphate (nitrate of iron), $Fe_2(SO_4)_3$, which is the commercial sort, consists chiefly of ferric sulphate. According to Moyret some of the commercial products correspond to the formula $Fe_4(S\,O_4)_5\,(O\,H)_2$. It is prepared by treating copperas with nitric and sulphuric acid. It may be used in place of acetate of iron.

The goods are evenly impregnated by a ferrous salt, well squeezed or wrung, and then passed through a weak solution of caustic soda, soda ash or lime water. A rinse in a weak solution of bleaching powder or hypochlorite and acetic acid is given to finally oxidize the ferrous hydrate The goods are then rinsed and dyed.

If ferric nitrate is used in place of ferrous sulphate, much better and also brighter shades are produced. The goods are impregnated with a solution of ferric nitrate (commercial) of 2 degrees to 6 degrees Tw., thoroughly squeezed and immediately pressed through a solution of soda at 1 degree to 3 degrees Tw. No further oxidation is needed.

Another way of producing iron buff results from bleaching, etc. The usual way then consists of impregnating the goods with clean nitrate of iron that has been prepared by dissolving to saturation iron-filings in nitric acid. The water mangle may be conveniently employed for this pur-

pose. The goods are given two or three turns and are then rinsed. An oxygenating bath is not required. The amount of ferric oxide precipitated on the fibers is what dyes the goods and the depth of color varies from a Nankin yellow to a light brown. To obtain heavy shades the process is repeated. Iron buff is loose to acids, but is fast to washing and light.

Violet and bordeaux are among the alizarine dyestuffs that can be and are produced on an iron mordant. For this purpose the yarn is boiled and oiled in the usual manner for *old red* and the yarn or goods is then worked in pyrolignite of iron at about 3 degrees Tw., for one hour and then rinsed and dyed as usual. Or the goods are treated with 3 or 4 pounds of tannic acid per 100 gallons of water, and then passed through pyrolignite at about 3 degrees Tw., and then rinsed and dyed.

Suitable shades can be produced by dyeing with the alizarines on a combined aluminum and iron mordant. For this purpose the yarn is first treated with sumac extract, like Prussian blue, then with basic aluminum sulphate, and finally with pyrolignite of iron. The following two or three shades will illustrate what can be done in iron buff.

Take two pounds of sulphate of iron (copperas) and dissolve it in warm water, and then add the requisite quantity of water for working the goods; work in this 20 minutes, wring out and put them immediately into a separate vessel filled with lime water made as follows: Into a barrel or other deep vessel filled with cold water, add newly slacked lime in the proportion of one-quarter pound to the gallon of water, then stir well and allow to settle; the clear is used for dyeing. This should be made up previous to using, as lime water standing attracts carbonic acid from the air and forms an insoluble crust on the surface which tends to weaken the solution. Work in this for fifteen minutes, wring out and expose to the air for half an hour, when the goods will assume a buff color. If the color is not sufficiently deep, this operation may be repeated, working through the same copperas solution, but using fresh lime water each time. The goods are then washed through clean warm water each time and dried.

Take four parts, by measure, nitric acid and one part of water; put the vessel containing the mixture in a warm place, and add by degrees pieces of iron so long as the acid continues to dissolve the metal with effervescence; then take out any remaining iron, and after setting for an hour pour off the clear and preserve from light. The solution has a brownish color and a syrupy consistence.

This is a nitrate of iron, and to a vessel of warm water add a half pint of the foregoing and work the goods for twenty minutes; wring out and work for fifteen minutes in another vessel with warm water to which has been added half a pint of caustic potash or soda; then wash through warm water, and if the color is not deep enough repeat the operation; wash again, wring out and dry. If a little soap is added to the last washing water of either of these two buffs, the color is improved.

Manganese bronze used in producing brown is really manganese chloride $Mn\ Cl_2 + 4H_2O$ and is known in commerce as bronze liquor and is chiefly employed in dyeing manganese bronze. The color is produced by impregnating the cotton with a solution of manganese chloride (the so-called bronze liquor, a by-product in the manufacture of bleaching powder being generally used) and fixing in a hot solution of caustic soda, about four degrees Tw. The caustic must be free from carbonate of soda, or uneven shades will result, the goods are finally passed through a weak solution of bleaching powder in order that the goods will complete the oxidation or the bleaching powder may be added to the caustic soda solution.

It is possible to dye heavy shades in this dyestuff by using it as follows: The goods are first passed through chloride of manganese at 15 degrees and then dried in the hot air. Then they are passed through caustic soda lye at 16 degrees Tw., and allowed to lie from three to four hours. They are thoroughly washed afterward and passed through a solution of a half pound of bichrome to 100 gallons of water at 120 degrees F. These goods are finally treated in a solution of bleaching powder at 1 degree Tw., and washed.

A great deal of difficulty is found in dyeing magnesium brown with evenness. The following is from a method personally given by J. Persoz to overcome this difficulty:

After impregnating the cloth in the mangle with the manganeous chloride at 25 degrees Tr., to which a small quantity of gum water is added, it is dried and passed through a hot solution of caustic soda, 22 degrees to 36 degrees Tw. By using this method very heavy and even shades could be produced at a single run, but a treatment of caustic soda at 22 degrees Tw., allowing the goods to lie about three hours additionally in the roll, this in advance of the final run in bleaching powder, is a marked improvement.

Manganeous chloride is also a good bottom for Indigo. It is especially good if first run in tannin, then iron or permanganate. The tannic acid color is finally destroyed by sodium peroxide or caustic potash. Prussian blue and iron buff may both be dyed by this process into full and dark shades.

Magnesium chloride or peroxide of manganese is found in nature in abundance, and is used in the arts for discoloring glass and for the manufacture of chlorine for bleaching. It is commonly of an earthy appearance and mixed with other ingredients, but is not infrequently met with in crystals of a black color and metallic luster. It undergoes no change on exposure to the air. It is insoluble in water and does not unite either with acids or alkali. On exposure to red heat it gives out oxygen, and is converted into deutoxide.

Khaki and the chromes are to follow in another number.

Wilson Cotton Mills Co., Wilson, N. C., and the Cedartown (Ga.) Cotton & Export Company, have installed the direct pull electrical stop creels, furnished by the Cocker Machine & Foundry Co., Gastonia, N. C., in connection with linking warpers. Mills which have recently installed the Coker combination linking and balling warper equipment with direct pull electrical stop creels are the Gaston Mfg. Co., Cherryville, N. C., the Bladenboro (N. C.) Cotton Mills, and the Whitnel (N. C.) Mills.

When you get into a tight place and everything goes against you, till it seems as though you could not hold on a minute longer, never give up then, for that is just the place and time that the tide will turn.

What the Southern Mills are Doing

A 15,000-spindle cotton mill is to be built at Wendell, N. C., according to report, which states that $250,000 in stock has been subscribed. R. B. Whitley, M. C. Todd, R. E. Richardson, Dr. T. A. Griffin, W. A. Scarborough and J. T. Allen are among the local people interested. Construction work, it is stated, will begin immediately.

Yarborough Mills, Inc., Durham, N. C., a recently organized concern, plan for the construction of a plant in which 100 box looms, with individual motor drive will be installed as initial equipment. A building of daylight mill construction will be erected.

Construction work will begin soon on the Sayles Bleachery, at Asheville, bids having been opened by the engineers, J. E. Sirrine & Co., on May 20th.

Minneola Manufacturing Company, Gibsonville, N. C., have placed a contract for a standard air cleaning equipment with the American Moistening Co., Boston, Mass.

The Dilling Cotton Mills, Kings Mountain, N. C., are to install 220 30-harness looms for the manufacture of broadcloth and other fancy goods, it is reported.

A new concrete reservoir, 66 feet in circumference, is being installed at the Dixon Mills, Gastonia, N. C.

Jones Fuller, and associates, of Durham, N. C., have organized the Gastonia Weaving Company, Gastonia, N. C., and will erect a plant in the latter city, according to announcement made during the past month.

Manville-Jenckes Company, High Shoals, N. C., have placed contract for additional automatic humidity control system with the American Moistening Company, Boston, Mass.

The Ora Mill, Shelby, N. C., has awarded contract to Michael & Bivens, Gastonia, N. C., for the installation of electrical equipment, including power and lights, at a cost of approximately $10,000. J. E. Sirrine & Company, Greenville, S. C., are the engineers.

Work on the Hanes Dyeing & Finishing Company, Winston-Salem, N. C., is progressing rapidly. The bleaching, dyeing and finishing equipment for this plant was furnished by the Textile Finishing Machinery Co., Providence, R. I.

The output of the Oakland Cotton Mills, at Newberry, S. C., has been taken over by the Kendall Mills, Inc. H. P. Kendall, president of Kendall Mills, Inc., purchased a large block of the common stock of the Oakland mill, and the capital stock has been increased from $500,000 to $760,000. There will be no change in the officers of the mill except that Mr. Kendall is now vice-president. Walter H. Hunt remains as president and J. N. McCaughrin as vice-president and secretary. The Kendall Mills, Inc., also operate the Addison Mills, at Edgefield, S. C., the Wateree Mills, Camden, S. C., and the Thrift Mfg. Co., at Paw Creek, N. C., as well as several mills in New England.

Village improvements are being made at the Graniteville Manufacturing Company, Graniteville, S. C., under the supervision of E. S. Draper, landscape architect, Charlotte, N. C.

A refrigerating equipment for icing water for drinking purposes is being installed by the Laurens Cotton Mills, Laurens, S. C.

Following are the details of the enlargement program under way at the Kershaw Cotton Mills, Kershaw, S. C. An addition of 13,000 spindles is being made to the present equipment of 12,000 spindles. A main building, opening room, warehouses and power house are being erected. T. C. Thompson & Co., Charlotte, N. C., have the contract for buildings. The motors are being furnished by the Allis-Chalmers Manufacturing Co., Milwaukee, Wis., and the General Electric Company have the contract for a 1,250-kw. turbine. The turbine condenser and heater will be furnished by the Elliott Co., of Philadelphia. Budger Sons Co., Boston, are furnishing the spray system. The Corliss engine will be dispensed with and the mill electrified. Group drive will be used for the entire mill except the spinning, which will have the four-frame drive. Contract for the village houses will be let later.

N. F. Ayer, treasurer of the Nyanza group of Mills, and the Cabot Manufacturing Co., of Maine, recently spent several days in Chattanooga, Tenn. He attended a directors meeting of the National Yarn Processing Co., of which he is a director, and while in the South investigated conditions in the Chattanooga territory. His visit is responsible for a rumor that his interests probably will establish a large spinning, weaving and finishing plant there in the future.

The Tellico Cotton Mill Co., has been organized at Tellico Plains, Tenn., near Athens, and construction, it is understood, has begun on a plant. B. W. Bingham, formerly superintendent of the Prendergast Cotton Mills, Prendergast, Tenn., is to be the manager of the new enterprise.

Twenty new bungalows for operatives will be erected at the Opelika Manufacturing Company, Opelika, Ala., contract having been let for their construction.

McIntosh Mills, Newnan, Ga., have acquired forty acres of land, and, it is understood, a commodious school building and six operatives' cottages will be erected, as well as a church.

Additional machinery for winding is being installed at the Bremen Looms, Inc., Bremen, Ga.

The new mill of the Arkansas Textile Co., Pine Bluff, Arkansas, has been put into operation. The plant is equipped with 10,000 spindles and complementary looms. The company is capitalized at $400,000, with the following officers: William Nichol, president; C. D. Stewart, first vice-president; L. W. Quattlebaum, Pine Bluff, second vice-president; Leroy A. Beers, treasurer and general manager; and J. E. Boyce, assistant treasurer and secretary.

Details of the plans for the Southern Brighton Mills, at Shannon, near Rome, Ga., call for a two-story spinning mill, 345x135 feet; a one-story, daylight construction weave room shed, 505x153 feet; warehouse and boiler house. J. E. Sirrine & Co., Greenville, S. C., are the engineers.

Swift Manufacturing Company, Columbus, Ga., has replaced 36 old looms with an equal number of new Northop looms.

The capital of the El Paso Cotton Mills, El Paso, Texas, has been increased from $500,000 to $600,000. The capacity of the plant will be doubled, it is understood.

The Monroe Cotton Mills, of Monroe, Ga., have just established a cooperative group insurance program for the benefit of their employees. Underwritten by the Metropolitan Life Insurance Company, the plan covers more than 170 mill workers for a total of approximately $85,000, and

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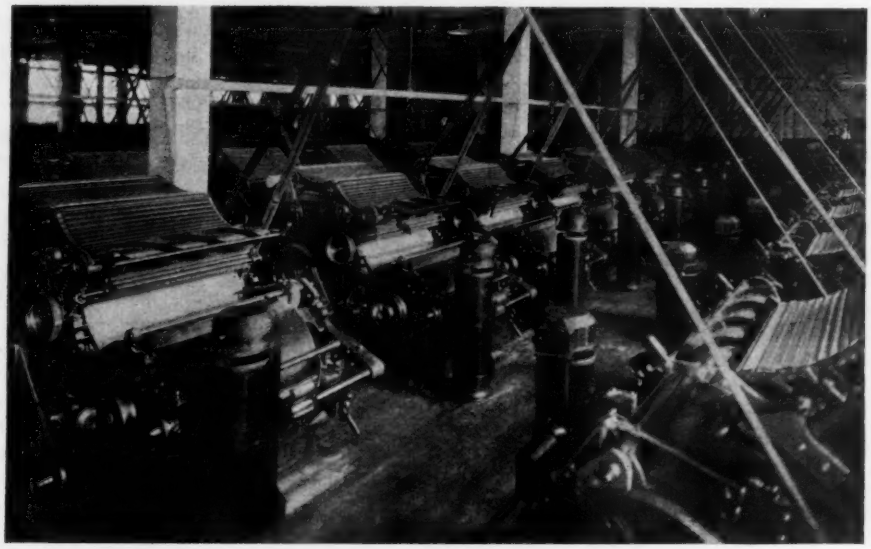

A Card Room—Riverside and Dan River Cotton Mills, Danville, Va.

The South's largest cotton mill, whose products are well known all over the world, uses Saco-Lowell Equipment Their equipment is always kept thoroughly modern.

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includes as supplementary features, certain service advantages.

The insurance schedule adopted by the Monroe Cotton Mills provides each contributing employee with $500 of life insurance and an individual health and accident benefit of $5 a week, for a maximum of 26 consecutive weeks. When offered to the workers recently, the plan proved so popular that within almost record time more than the legal number required to make it effective signed applications for the insurance.

Moderate in cost to the employees, through the cooperative feature whereby the employer and workers jointly pay the premiums, the plan carries exemption from medical examination and no restrictions as to age.

An important feature of the policy is the disability clause, providing for the full payment of his insurance to any employee, who becomes totally and permanently disabled before age 60. The payment will be made in equal monthly installments for a stipulated period. During the disability period no premium payments are required from the sick employee.

Among the service advantages available to Monroe Cotton Mill workers, are a free visiting nurse service, and a department for the distribution of booklets on health subjects. The former enables any sick or injured employee to summon a nurse who will act in an advisory capacity and assist in carrying out the attending physician's instructions, all free of cost to the invalid, as the entire expense of the nursing service is borne by the insurance carrier.

The New England Mill Situation.

Curtailment of production has become quite general in this section but it has not reached anything like the proportions of a year ago. The Rhode Island Manufacturers' Association has gone on record as opposed to the policy of curtailing production, in accordance with the suggestion of the National Council of Cotton Manufacturers, as the members are of the opinion that the serious trouble in the country's cotton goods industry arises from the methods of merchandising and the character of the output.

It is contended that mills should have foreseen the folly of going ahead with the production of staples for which the markets have become limited and should have devoted more attention to finding out what the market will take and then naming it. Throughout Rhode Island, as in some other sections, there has been a radical change in the character of the output and it is likely that this will continue. Rayon fancies of many sorts are being made in mills that formerly made fine yarn dyed fancy cottons exclusively. Some mills that confined their production to staple shirtings, lawns, fine muslins, etc., are now running on fancy shirtings, broadcloths, and many other goods the markets will take.

This action in Rhode Island is along the lines suggested two or more years ago by a president of the National Association of Cotton Manufacturers. In addition to recommending a diversity of production, it was then stated that different methods would have to be found for presenting goods to the consumer. This has led to the adoption of many national advertising plans by some mills and to the changing of the methods of selling agences by others. It is much too early to say whether some of the new plans being tried out will be successful.

In Fall River, the curtailment of production is chiefly in print cloth yarn goods. In that city barely a third of the normal or capacity output of print cloth yarn goods is being made. Some mills are wholly idle and have been so for 18 months. There are others that are operating from one-half to three-fourths of their looms. The fine goods mills are comfortably well employed and they constitute now about one-fourth of the spindleage installation in that city. One estimate made about the middle of the month was to the effect that 50 per cent of the capacity output of Fall River was all that was being turned out now.

But in that city, the large American and Algonquin Printing companies, having 58 printing machines in all, were running to about capacity, and in the case of the American, some departments were being run till 8 o'clock at night. The mercerizing department, which is the largest in any print works in the country, was running 24 hours a day.

This was due to the large business booked on printed broadcloths, voiles, pongees, sateens, and fine count wide print cloths. The company is still very busy on goods for export, this portion of its business amounting to about one-fifth of the capacity of the plant. There are also one or two mills in the city that are running some departments at night, this of course being exceptional.

In New Bedford, the center of the fine goods industry, the mills are more than 80 per cent occupied and some have all the business they can handle. The business is diversified, silk and cotton, rayon, and fancy shirtings, making up a large share of the production. The demand for the staple fine goods, such as lawns, pongees, voiles etc., has been fitful. The great volume of broadcloth business done last winter kept many looms occupied in that city. Latterly that business has fallen off.

In Manchester, N. H., the Amoskeag Company is operating five days a week, most of the business in hand being very fancy ginghams, napped cottons, and a wide variety of specialties. In Maine, the mills are running irregularly. The Peperrell mills are running four days a week in some departments. Some of the Lewiston mills are running full time with part of the machinery idle, while others are running short time.

In Connecticut, the cotton mills are doing rather better than in other states. One reason is that the large plants making fine cottons have diversified their output greatly. One large mill, famous in the trade for the high quality lawns it used to make, has not turned out a yard of lawns in nearly a year. It is engaged largely on fine broadcloths and fine sateens. Another large fine goods mill is running almost exclusively on fancies or rayon mixtures. Two cotton mill plants in that state are now running exclusively on rayon fancies.

It was stated in this correspondence some time ago that a change of great moment was coming over the popular mind in New England toward the industries of the section. This was evidenced recently in the adjustment of the protracted tax suits in Manchester, Fall River, and Lowell. In Fall River, it was agreed to reimburse the mills to the extent of $1,000,000, and to borrow that amount of money through special legislative enactment, in order to bring the long fought cases to an end. Moreover, the existing boards of assessors have modified their mill valuations greatly, so

How Kaumagraphs helped Hess, Goldsmith & Company, Inc., put over a new fabric

Miss Ann Pennington in a bathing suit creation by Bobé-Betty, Ltd., made up of the new silk fabric, Cross Word Puzzle Prints.

IN tune with the times! That certainly describes Hess, Goldsmith & Company's new silk fabric *Cross Word Puzzle Prints,* for which Ann Pennington so graciously poses in the accompanying picture.

Hess, Goldsmith & Company, Inc., showed keen merchandising skill in bringing out such designs and giving them such a clever name.

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What a Kaumagraph is

A Kaumagraph Dry Transfer is a slip of paper upon which a design or trademark has been imprinted by our special process. The transfer is applied with a hot iron, sometimes by hand, as in the case of hosiery; usually by machines, as in the case of selvage marking.

No other method like it

Kaumagraphs have advantages which no other method of marking has: the transfers are supplied in a wide range of colors; they come singly or in rolls; a one-quarter inch selvage can be followed accurately even on irregular goods; when a machine is used, a speed of 90 yards a minute can be obtained. The Kaumagraph mark is more easily applied than any other; the result is incomparably more beautiful.

Hess, Goldsmith & Company, Inc., show you in *Cross Word Puzzle Prints* the value of Kaumagraphing. Listen now to what they say about the method:

"It stands to reason that we must think pretty highly of your product, to continue its use for nearly twenty years. This year we are purchasing more from you than we have in any previous year. The Transfers are supplied to the dyers and finishers, for application on our goods.

"We recognize that the use of Transfer marked merchandise enhances its salability and protects the customer against substitution. We always endeavor to bring to the attention of our trade the fact that our goods are trademarked on the selvage, and that the consumer should look for this trademark as a matter of assurance."

You can do the same

Why can't you put your product across just as spectacularly as Hess, Goldsmith & Company, Inc.? Let's talk it over.

We will gladly come to your office wherever it may be and discuss with you the matter of trademarking your product. There will be no obligation. You will risk nothing. On the other hand, you may learn a new way to increase your business!

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Don't bother to write. Simply put your name and address on the convenient coupon below and mail today.

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Cotton 6-25

that the industries of the city are no longer penalized as against other properties of a taxable character. In Manchester, a somewhat similar basis of tax readjustment was arrived at. In Lowell, a meeting of citizens, mill owners, and selected business men, took up the whole question of changing the attitude of the municipality toward the corporations, with the result that the mills are now to be backed more generally in any policy deemed necessary for their maintenance.

The only labor trouble of a prolonged character seen in the whole section recently has been a strike in the mills of the American Thread Co., at Willimantic, Conn. The mill attempted a wage reduction of 10 per cent, and for the past ten weeks the plant has been unable to run but a small part of the machinery. Feeling ran high against the corporation. In part, it was due to the foreign ownership of the concern. It is a part of the big thread combine in England, and according to published reports has always made considerable money for the parent organization. The company owns mills in Fall River, Newark, and the South, and has been well managed for many years.

Another labor dispute was settled by a board of arbitration. The Monument mills of Housatonic, Mass., manufacturers of yarns and bedspreads reduced wages 10 per cent, at the time other mills of New England changed their schedules, and a strike was averted by placing the matter in the hands of a board, which included the former Governor Walsh and also a former United States Senator. This board found against the mill by reporting in favor of a four per cent reduction, which will probably be accepted.

There has been some questioning of the government cotton reports recently among manufacturers because of the census department's claim that cotton consumption in the country, and spindleage activity, in April, exceeded March. As the government figures relate to the whole cotton consumption of the country, including uses made of the staple in other than spinning or weaving mills, it is impossible to say just where the disparity complained of lies. It may well be that some mills reporting for March covered a period of only four weeks, and made the April reports one of five weeks. The point the manufacturers stress is that actual curtailment of spindle operations in April was greater than in March.

Job finishers have been running lighter for the past month than in the month previous, in almost every division. The job printers have had an especially slack time. The dyers have done pretty well but few of them have run to capacity limits. The larger corporation printers, on the other hand have run very full, notably the Arnold, Windsor, American, Pacific and Algonquin. They have made it very difficult for the converters to operate successfully. These large corporations have completely changed their methods by producing fancies and styled goods as the market calls for them and devoting less attention to the straight prints and percales.

The bleached goods business in 4-4 goods has been most unsatisfactory to the smaller operators at least. The Pacific is one large bleachery that has been kept humming, using southern goods largely, and the prices at which these goods have been marketed have made it unprofitable for converters or small bleachers to try to compete. Moreover, the demand at best has been fitful and restricted because of the smaller consumption of the goods in the lingerie trades. The wide sheeting business has been irregular. The great additions made to wide looms in the past three years in this section as well as the South, has brought the wide sheeting business as a whole into a competitive circle and prices are more irregular and closer than has ever been known in that division. The choice branded goods sell, but others have a hard struggle to secure a profitable market.

There is a growing demand among New York converters for goods from 45 to 54 inches wide for general converting purposes. The same development is noted in silks. Some mills are adding to the number of wide looms in their plants. Others hesitate as they doubt whether they will be able to make any larger profit from the wide looms than from the 40-inch fine goods looms that have hitherto sufficed to supply the needs of the trade.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, May 8th, 1925.

In our previous review, when there was anxiety over the drouth situation in the southwest, we stated in part as follows: "The usual wet season for the southwest is near at hand; the last half of April and all of May, and it is possible that the needed rains in Texas will soon be provided, in which event the outlook for a crop in the southwest would be improved materially insofar as its start is concerned."

Meanwhile the needed moisture has come to Texas and Oklahoma, alternating, well distributed rains having occurred over the greater portion of the southwest which effectually broke the prolonged drouth, causing the market to decline about $10 per bale compared with one month ago.

Oklahoma and the northern half of Texas has been soaked, and while south Texas has obtained temporary relief, more moisture is needed in that section. Dry, warm weather is now desired in Oklahoma and the northern half of Texas, because if the rains continue in those parts, planting, already late, would likely be delayed all the more.

On the other hand, a general heavy rain is urgently needed in the central and eastern portions of the belt, from Louisiana and Arkansas to the Atlantic Coast to cause germination of the late planted, and to complete planting, as many farmers are awaiting rain to finish seeding.

In other words, the situation in the cotton region is quite the reverse of what it was one month ago when rain was needed in the west and dry weather in the east, now dry weather is wanted in the west, and rain is desired in the east.

It is likely, however, that the eastern half of the belt will soon receive moisture. The danger is that there may be too much rain in the southwest, as much rain usually occurs in May, the precipitation often being excessive, sometimes incessant, which would be anything but favorable where planting has been delayed because of the recent drouth to the west of the Mississippi River.

Contrary to general early expectations, when there was talk of a probable decrease in this year's cotton acreage, due to the necessity to raise large crops because of the very high price of corn, late private advices indicate that there will be a substantial increase in this year's cotton acreage, private estimates ranging from 2 to 6 per cent; the latest of estimates being the highest, ranging from 4 to 6 per

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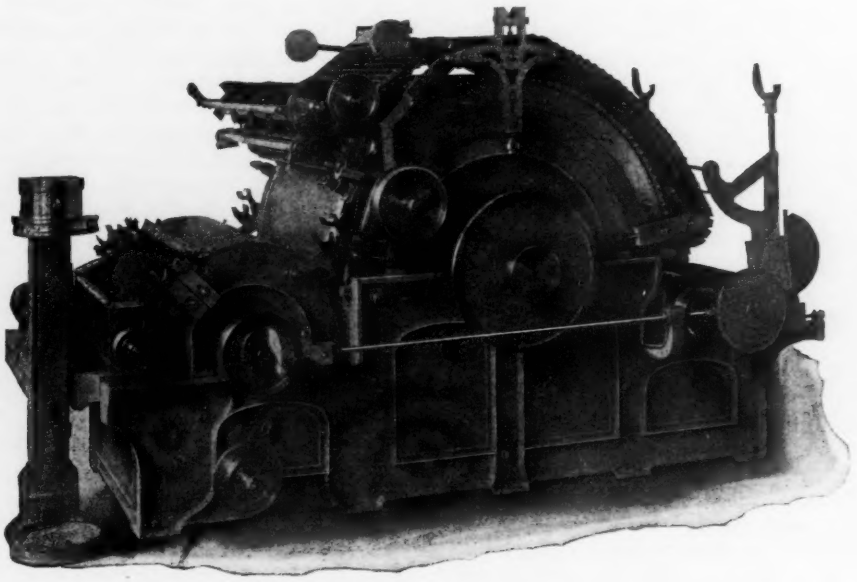

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Perfect concentricity of Flats to Cylinder.

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Adjustable Cylinder Pedestals and Bearings.

Better quality of yarn made from the same cotton, or equally good yarn made from cheaper cotton.

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cent, which would point to a probable increase of about 5 per cent, or a total acreage of about 43,564,000 compared with last year's previous record acreage of 41,490,000 plus an increase in the use of fertilizer.

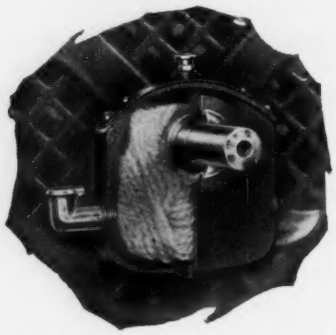
Consideration of foregoing returns would make for a bearish situation, especially with the world's visible supply larger than last year by 1,000,000 bales, were it not for the fact that Oklahoma and Texas were deprived of their full measure of winter rainfall, which, notwithstanding the spring rains, leaves the crop exposed to the possibility of serious harm in the southwest in event of a serious summer drouth.

Aside of possible adverse weather conditions in the southwest next summer, the weevil, especially in the eastern half of the belt, have to be reckoned with. Latest official report as to weevil emergence up to May 1st is that while the emergence in the central belt is comparatively light, it was heavier than last year in the eastern belt, while in Texas it is approaching a normal stage.

Meanwhile, last year's large crop of about 14,500,000 bales including linters, is fast going into consumption, as spinning takings for the season point to about 14,000,000 bales vs. only 11,042,000 last season, due to large exports this season, which promise to total 8,000,000 bales vs. only 5,658,000 last season. Already 14,033,000 bales of last year's crop have been marketed, which leaves very small stocks in the interior outside of Houston. Compared with last year the world's visible supply of American cotton is 2,756,000 bales vs. 1,701,000.

An Unique Oiling Method.

A new lubrication system for small, fractional horsepower motors, developed by the Century Electric Company, of St. Louis, Mo., depends for its effectiveness on the use of a number of continuous strands of pure wool yarn introduced into the bearing housing and oil well to provide a method of carrying oil to the shaft surface. The strands of wool yarn are packed into the oil well, as is shown in the illustration, so as to fill it comfortably, and are in direct



contact with the surface of the armature shaft. Constant contact of the wool yarn with the shaft surface is assured by a spring attached to the underside of the oil well cover, which exerts a downward pressure against the wool It is claimed that the wool yarn used in this type of lubrication will in itself hold sufficient oil in suspension to properly lubricate a small motor for at least one year's continuous 24-hour-per-day operation.

The high absorption factor of pure wool yarn is utilized in this method, so that when the lubricant is introduced into the oil well, it is immediately absorbed by the yarn. Aside from the oil held in suspension by the yarn, there is of course an additional supply in the oil well. Since the strands of the yarn are continuous, they allow capillary action to asset itself so that the lubricant is continuously delivered to the armature shaft, it is stated. The pronounced capillary action of the yarn, the manufacturers say, causes a new supply of filtered oil being constantly delivered to the shaft. The system, it is stated, eliminates tendency of oil bubbling and the possibility of clogging up the oil returns to the oil well, as well as insuring proper lubrication even at low temperatures.

Notes About Men You Know or Know About.

C. R. TILLSON has become assistant superintendent at the Miller Cotton Mills, Waco, Texas.

W. L. STEPHENS has become overseer of the cloth room at the Arkwright Mills, Spartanburg, S. C.

T. H. WOODS has been made overseer of the cloth room at the Stonewall Cotton Mills, Stonewall, Miss.

F. H. FRIES, of Winston-Salem, was elected president of the Indera Mills, Winston-Salem, succeeding W. L. Siewers resigned. H. G. Chatham is vice-president, J. E. Lee Kiger, secretary and treasurer, and H. E. Foy, Jr., sales manager.

ROBERT CAMPBELL is overseer of spinning at the American Thread Company, Dalton, Ga.

J. W. KIMBERLY has been promoted to the position of overseer of carding at the No. 2 Mill, Profile Cotton Mills, Jacksonville, Ala.

D. C. JOLLEY now is overseer of carding at the Wallace Manufacturing Company, Jonesville, S. C.

B. J. BODDIE has been made superintendent of the Greenville (S. C.) plant of the Lullwater Manufacturing Company. He was formerly overseer of weaving.

J. A. MOOTY now is assistant superintendent of the Aragon Mills, Aragon, Ga.

JOSEPH OUTEN has been made overseer of weaving at the plant of the Highland Park Mills, at Rock Hill, S. C., succeeding G. R. Matthews, resigned.

RALPH POWELL is the manager of the Powell Knitting Company branch, to be operated in the Model Mill building, Spartanburg, S. C.

The Lincoln Electric Company of Cleveland has successfully applied welding to the construction of heavy duty hand trucks, for their portable welders, and used in its factory to transport parts and material about the plant, it is announced. The trucks are built by welding structural steel together with the Lincoln "Stable-Arc" welder. The use of this method in the construction of the trucks is said to increase the strength of the trucks at the same time reducing the weight. Then the wheels of the steel trucks are made through the use of welding. The sides of the wheels are two disks, the tread a circular band with ends welded together to form a ring. At the center a piece of tubing is welded and machined internally to serve as a journal for an axle and ten rollers, giving a roller bearing. This construction has been made possible, it is announced, through the advance of the application of welding during recent years. The advantage of the "Stable-Arc" welder, it is stated, has made possible the economical fabrication of the steel.

NOTES ABOUT MEN YOU KNOW OR KNOW ABOUT

ROBERT A. MORGAN, for the past six years connected with the Maginnis Cotton Mills, New Orleans, La., formerly as assistant agent and for the past several years as agent, has resigned to become agent of the Southern Brighton Mills, which are building a plant for the manufacture of tire fabrics at Shannon, near Rome, Ga.

H. C. HARDEE is general superintendent of the Houston Cotton & Twine Mills, Houston, Texas. William H. Morgain is night superintendent. R. T. Akins is day overseer of carding, with H. G. Hoke in this position on the night shift. F. W. Barnes is day overseer of spinning, and H. L. Morgain is night overseer of spinning, twisting and winding. W. M. Lucas is overseer of twisting and winding on the day shift. R. R. Swinder is shipping clerk and timekeeper.

W. H. SHUMATE, formerly assistant superintendent of the Nantucket Mill, Spray, N. C., is now superintendent of the Fieldale Mill, at Fieldale, Va.

WILLIAM W. SCHOFIELD, formerly overseer with the the Stark Mills, Manchester, N. H., is now with the Dundee Mills, Hooksett, N. H., as overseer of spinning spooling, warping and slashing.

H. G. EDMISTON has been made superintendent of the Denison Cotton Mills Denison, Texas, succeeding G. W. Maddox.

A. CULBERSON has been elected vice-president of the C. R. Miller Manufacturing Co., which operates the Miller Cotton Mills, at Waco, the Texas Cotton Mills, at McKinney, and the Dallas Textile Mills, at Dallas, Texas. Mr. Culberson, it is understood will be in charge of production for the company.

R. E. KINKEAD, formerly chief engineer of the welder division of the Lincoln Electric Company, Cleveland, Ohio, has been transferred to the sales department, as regional director of sales.

R. C. SIMPSON, formerly night overseer of weaving at the Lancaster Cotton Mills, Lancaster, S. C., is now assistant overseer of weaving at the No. 3 mill of Republic Cotton Mills, Great Falls, S. C. C. F. Knight has succeeded Mr. Simpson at the Lancaster mill.

H. I. TURNER, of Charlotte, N. C., now represents the Charles Bond Company, of Philadelphia, in the North Carolina territory. He is a brother of John C. Turner, who formerly covered this terrifory, and who will make his headquarters in Atlanta, Ga.

B. H. LOWE has become assistant superintendent of the Ottaray Mills, Union, S. C.

A. L. CRANFORD recently became overseer of weaving at the Fountain Mills, Tarboro, N. C. He formerly was with the Dacotah Mills, Lexington, N. C.

F. C. TODD, formerly superintendent of the Ruby Mills, Inc., Gastonia, N. C., has become vice-president and general manager of the Rocky Face Spinning Company, Stony Point, N. C.

L. O. BUNTON, formerly assistant superintendent of the A. M. Smyre Manufacturing Company, Gastonia, N. C., has accepted the superintendency of the Ruby Mills, Inc., Gastonia, succeeding F. C. Todd.

J. E. EUDY has returned to his former position as superintendent of the Ellerbee Knitting Mills, Ellerbee, N. C.

G. W. JOHNSON, who recently resigned as overseer of weaving at the Fountain Mills, Tarboro, N. C., has taken a similar position at the Cochran Cotton Mill Company, Cochran, Ga.

W. P. NORMAN has been promoted to the position of overseer of carding at the Hartwell Mills, Hartwell, Ga.

R. L. LIPSCOMB recently was made cloth room overseer at the Red Springs Cotton Mills, Red Springs, N. C.

LUTHER H. HODGES, assistant to the general manager, Carolina Cotton & Woolen Mills Company, Spray, N. C., spent two weeks in May at Fort McPherson, Atlanta, Ga., in the reserve officers training corps.

J. L. HINSON has become overseer of carding at the Liberty Mills, Clayton, N. C.

J. E. BYARS recently was made superintendent of the United Mills Company, Mortimer, N. C. He formerly held a similar position at the Gambrill & Melville Mills, Bessemer City, N. C.

B. B. BURNETT has become overseer of spinning at the Florence Mills, Forest City, N. C. He formerly was overseer at the Henrietta Mills, Caroleen, N. C.

J. C. BRANNAN has been made overseer of spinning, spooling, twisting and winding at the Porterdale Mill of the Bibb Manufacturing Company, at Porterdale, Ga.

J. R. COPELAND has become overseer of weaving at the Alta Vista Cotton Mills, Alta Vista, Va. He formerly was with the Judson Mills, Greenville, S. C.

ROBERT T. GOSSETT has accepted the position of overseer of spinning at the Franklin Process Spinning Mills, Fingerville, S. C.

OSCAR STOFER recently was made overseer of weaving at the Burlington Mills, Inc., Burlington, N. C., succeeding B. H. Lowe, resigned.

T. A. BLAND has been promoted to overseer of quilling, slashing and weaving of the Mayflower Mill, Cramerton Mills, Inc., at Cramerton, N. C.

V. C. SMITH has returned to his former position as overseer of weaving at the Gambrill & Melville Mill No. 1, Bessemer City, N. C. He has been connected with the McLean Mills, Bessemer City.

J. L. WOFFORD, formerly with the Lydia Mills, Clinton, S. C., has become overseer of weaving at the Buffalo plant, Union-Buffalo Mills, at Buffalo, S. C.

T. E. YOUNG, formerly superintendent of the Riverside Manufacturing Company, Pendleton, S. C., has accepted the position of overseer of spinning, spooling and warping at the Victor-Monaghan Company, Walhalla plant, Walhalla, S. C.

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AN OLD TIMER SAYS

If you want me to I will get you that big job you have always had in your mind that you would have some day.

"Gosh! 'Old Timer,' that sounds good——"

But wait a minute, you did not let me finish what I had to say. I will also buy you that farm or that home in town that you have often thought you would like to have before you get too old.——Yes, and I will go you one more—I will also get that new car that you know would give you so much pleasure. In fact, I will get you most anything in the bounds of reason that you desire—*Providing* you will treat me right. If you will only treat me as well as your conscience tells you that you should, I will do everyone of the things itemized above, and more. But I am pretty fussy about the way I want to be treated. In fact, you don't seem to appreciate me like you should. You not only turn a cold shoulder to me pretty often but I sometimes hear things you say about me that gives me cause to wonder what you would do if you were to wake up some fine morning and find out that you did not have me to fall back on.

It is a strange fact in human nature that practically every person knows when they do anything wrong. There are very few things that we human beings do wrong without our conscience telling us at the time that it is wrong.

Then why in common sense do we do them? All I can say is "Damfino."

The same reasoning applies to most of us as overseers and superintendents.

If there was only some way that "Old Timer" could get overseers and superintendents to realize that if they would only run their jobs like they know they should run them—if they would only do what their conscience tells them to do—Well, I would feel like I had done something worth while for my brother overseers and superintendents and I would be very much encouraged. It is so hard to get the average man to realize that the "Tall tree did not grow from the little acorn in *one* day."

The mountain climber does not ***run*** up the mountain. He selects a place to put one foot and he makes sure that it is a firm foundation and that the foot will not slip back before he gets the next step planted—and as he gets higher up the mountain he is even more careful to make sure that it is a firm foundation and that the foot will not slip back before he gets the next step planted—and as he gets higher up the mountain he is even more careful to make sure of every step he takes, doubly sure that he will not slip back.

That's the way to climb successfully, brother.

That is the *safe* road to success.

So many of us get part the way up the mountain and strike a level place and find the going so easy that we just let her "rip," so to speak.

What happens—first thing you know we are sailing along so nicely that we begin to relax—we don't keep our eye on the road like we know we should, and into a mud hole we bump and roll out on the other side with a broken spring. Well, it is not much trouble to fix that, and we are on our way again just like there could never be another mud hole in the road or a sharp curve that you could run off of and tumble all the way back down that darn mountain that you worked so hard to climb part of the way up.

Just think over the overseers and superintendents that you know and see how many have had pretty good jobs—but did not keep that eye on the road, or did not plant that foot so it would not slip back, or, to go back to the point I was trying to drive home to you—

They did not run their jobs like their conscience told them they should.

"Philosophers claim that all possibilities exist from the moment that we admit the possibility of their existence."

Or, to put that in plain "United States," it means that it is entirely possible for you to get that big job, that farm, that home, that auomobile, the moment the desire enters your mind if—Yes, "If?"

If what? Oh! the devil! I just get all balled up trying to find some new way to get you to wake up—to realize that it is *you* and *you* alone that you must be master of. You can surprise yourself if you will only try—but, confound it, I can't get you to try hard enough.

You will find the answer to that big "If" mentioned above in practically every "Old Timer" article you have read. Just think of the men you know that would be "tickled to death" to have their old jobs back.

They did not place that foot so it would not slip back—they got too impatient and stepped too quick. They got to where they could not appreciate the job they were on. They got the "swell head" and thought the "old man" could not get along without them. They were put in the line of promotion and expected their salary to be raised the next day.

Say, honest now, pardner, how many overseers and superintendents can you think of that some of these conditions will fit?—And I am here to tell you right now that they will say the same thing about *you*, if you are fool enough to get in the same fix.

A young man called me up the other day from a nearby town:

"Hey! 'Old Timer,' how are you?"

(*Continued on page* 836.)

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HOW OTHER MEN MANAGE

Practical Discussions by Cotton's Readers On all varieties of Mill Subjects

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Asks Suggestions for Card Settings.

EDITOR COTTON:

I believe some of your readers can help me out of my trouble. Although much improved, I believe it could be better.

The trouble is, I am taking out too much fly on the cards. We are running 1⅛-inch stock, 42½ and 43½-pound lap, making a 55-grain sliver; doffer making 12 r.p.m. I have tried several settings, and this is the setting I now have:

The flats are set to a 9 gauge; cylinder screen from 34 to 64; licker-in screen, 22; feed plate, 10; mote knives, 7 and 5

If any readers can give any other card settings that may help me, I'll appreciate it. E. A. G. (N. H.)

High and Low Card Flats.

EDITOR COTTON:

I would like to discuss, for the comment of the readers of "How Other Men Manage" the matter of card flats. As everyone knows, there are near 110 flats on each card, and 44 of these are working at one time when the card is in operation. Their work is to assist the cylinder in straightening the fiber and to take out the leaf and short dirty fiber.

I think flats should be ground with a drum or traverse cylinder at least six times a year, and care should be taken not to grind too heavy, as heavy grinding tends to hook the wire and cause it to collect cotton and trash. This results in constant burnishing, which harms the wire; also, if the burnisher is set too deep it will loosen the foundation of the clothing.

The time to grind is at the same time the cylinder is ground, and the flats should be set correctly before the card is operated. Settings should not be closer than a smooth 10/1000 unless the card is in perfect condition and there is no vibration; then 7/1000 can be used, but such an instance is a rare exception. I prefer these settings, back to front: 12, 12, 10, 10 10/1000. This will give a good clean sliver and will not face either cylinder or flats.

Flat grinding should be done so there will be no low places on the flats. But, the average carder will say, I haven't got any low places. Let him go to a card and have the grinder take off a flat on each card, and crank them to the center stand, and take a test for himself, and he will find that his grinder is setting to the high places.

After this is done, the cards that have flats which are hollow at the center should be noted, as well as how much they are out of "set." They should be ground to get them level. When flats are out 5/1000 or more, I would suggest setting the grinding down to 7/1000 at one end and pulling down the drum so as to bring sparks at the other end and letting it grind for seven to eight hours at each end. This will give a much smoother flat. Where flats are out less than 5/1000, I suggest using toilet paper under the emery at each end of the drum, very thin paper, beginning by putting in three-ply, then two-ply, and then one. This will give the proper taper on the drum. Then proceed to grind as usual. BOB (S. C.)

The Effect of Worn Bolsters and Spindles.

EDITOR COTTON:

I am just completing the task of overhauling all of my fly frames, and might be able to answer to some degree the question that "Contributor No. 812" asked in a recent issue of COTTON concerning worn bolsters and spindles on fly frames affecting the running of the work.

Our speeder tenders run four 152-spindle fine frames on 5.50 and 7.00 hank roving. They were kept pretty busy before the overhauling. The overhauler was careful to replace new steps, new bolsters and new spindles wherever there was any considerable wear. All of the overhauling was done in the winter and now summer is approaching, and we find that we can still run with the same twist, even though the days are beginning to get hot. The speeder tenders are sitting around, and one told me that he had to walk over the mill once in a while to kill time.

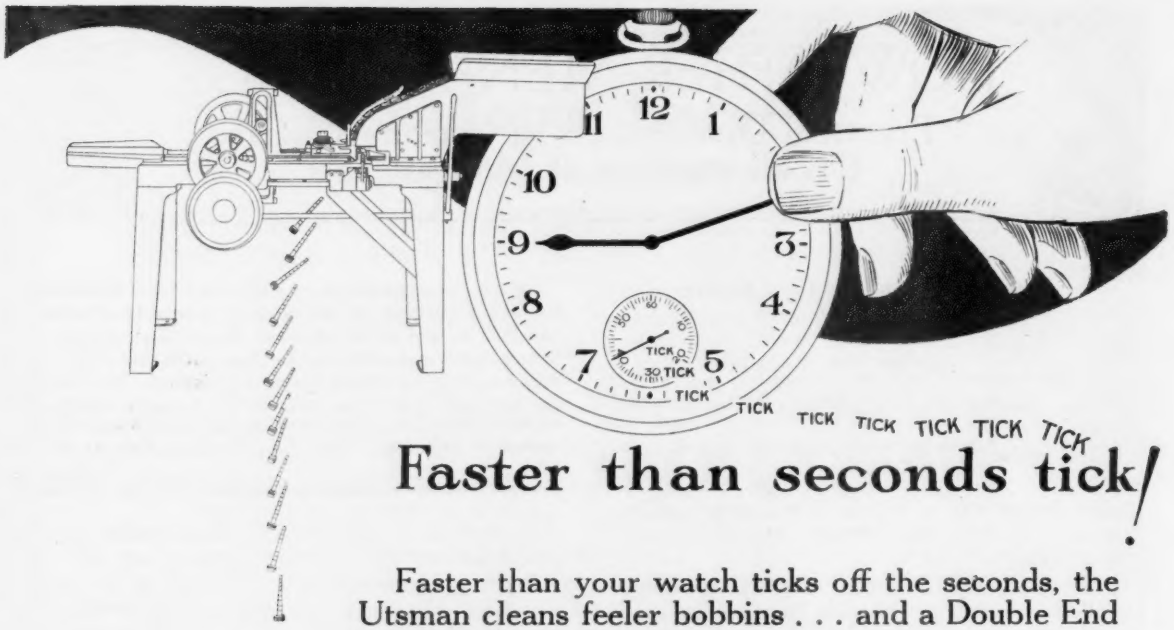
Some of the speeders will run a whole doff with an average of only one end down during the whole time. All of this on an average of flat 1-inch staple local cotton. Generally, worn bolsters and spindles mean unbalanced flyers, and wavy roving. It pays to overhaul regularly and replace all worn flyers and bolsters and spindles.

R. J. R. (N. C.)

EDITOR COTTON:

In answer to "Contributor No. 812," who asks the question, "In what way do worn out bolsters and spindles on fly frames affect the running of the work, and what effect do they have on the breaking strength of the yarn?"

Picture in your mind, if you can, what takes place from the point of the spindle and the base for its reception to the boss of the flyer, when the bolster is worn. The in-



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creased field of the spindle inside the bolster causes vibration. Vibration causes the point of the spindle to leave its base while rotating at a high rate of speed, which in a short time destroys the point, the spindle base, and also the spindle step, instead of being pointed, is rounded, which increases the vibration. In most cases such vibration soon wears the spindle gear, and also spatters the oil from the spindle step, which is dry for lack of oil and soon wears, and such a condition will cause running over and under.

Please be reminded that we have the bobbin-lead system. Therefore, the bobbin leads the flyer. To prove to to what extent a worn bolster affects the evenness of the strand, make the following test: Pick out a flyer having a worn pin, and place it on a spindle revolving in a perfectly fitting bolster. When the set is full, move the flyer back and forth, and notice how the movement strains the strand. Next, place the same flyer on a spindle in a worn bolster, and there will be a greater stretch.

However, I want to be fair here and state that these conditions occur only when the speeder is started and stopped. This is enough to cause a large amount of weak places in the strand that will cause poor spooling and warping, and, of course, poor weaving.

I want to take this opportunity to congratulate "Contributor No. 812." I wish we had more men like him. Like the writer, he has discovered that things are not just right at the end of the presser finger. He is perhaps on the fence, wondering whether it is due to the bobbin-lead system that causes two tensions when the frame is started and then stopped, or if it is due to a worn pin in the flyer or a worn bolster, or to the worn condition of the spur gears in the train from the driving shaft to the front spindle shaft. He is helping to brand the bobbin-lead as the worse system by asking what I term a very practical question.

On a bobbin-lead frame, we find the cone belt slips a little. When the frame is run at its highest speed, the pressure is greatest at the end of the presser pad, and the strand must be drawn past this pressure. When the pins in the flyers are worn, the flyers lag behind the speed of the spindle at starting, and stretch is the result. Now I hope it will be admitted that the chief cause of the trouble he is having is due to the bobbin leading the flyer. However, overlooking these defects, the bobbin-lead looks okeh to me. WASH (R. I.)

By going into the question of "Contributor No. 812" at length and very closely, it is possible that a number of probabilities might turn up, but on the face of it, worn out bolsters and worn out spindles on fly frames would be very likely to do nothing more than to pull thin places in the roving, causing the work to run bad in the fly frames if these parts are badly enough worn. Of course this roving with the thin places made by the fly frames will not make even strong yarn and the breaking strength will undoubtedly be low. B. R. B. (S. C.)

EDITOR COTTON:

In reply to "Contributor No. 812," regarding, "In what way do worn out bolsters and spindles on fly frames affect the running of the work and what effect do they have on the breaking strength of the yarn?" will say that excessive vibration of the spindles will first make soft weak roving that will not unwind at the next process without becoming stretched by this softness, making thin places. Especially is this so if there is the least friction on the skewers where this bobbin is put on, and the yarn sometimes broken back by being too weak to stand the weight of unwinding. The jerking of too many of them on one frame will become very aggravating to the tensions, and these will have to be regulated to average up and get the frame to run. Doing this will cause some ends to run too tight and stretch the roving, and others too slack, that do not take up the required twist.

Regarding the breaking strength, when the spindle swings out too far from the usual center where it is supposed to be plumbed and at a certain distance from the front roll that is delivering the roving at so much per minute, the roving is bound to become stretched a little bit, and at this point of stretch there is a weak place and then a little thick place, and yarn is no stronger than its weakest place. The greater the vibration the greater is this weak place.

We had this same trouble on some old slubber frames not so long ago, and we had the spindles and bolsters all re-worked and put in good shape, including the steps, as these latter will contribute their part toward not letting the spindles run true and smoothly. Now we have the spindles, bolsters and steps in good shape and are producing good work—good enough for 45s filling from one-inch Middling cotton, and what can be done on slubbers can be done on all roving frames. So that is the solution. I would advise "Contributor No. 812" to do this if he is having very much trouble of this character, especially to try one frame and see the difference.

I could give the name of the place to get this work done but—well, look up the advertising in COTTON. It can or should be found. CONTRIBUTOR No. 14.

Suggested Layouts for 20s to 24s Yarn.

EDITOR COTTON:

In answer to "Contributor No. 31," who wishes a lay-out for 20s to 24s yarn, using 7/8-inch cotton, the following is a good lay-out for making these yarns to get ideal drafts and settings:

Breaker picker; hopper feed; 14-ounce lap delivered; two-blade beater, 5/8-inch top setting; 1 1/8-inch bottom setting, beater speed 1,000 r.p.m.; intermediate picker, 14-ounce lap fed, 14-ounce lap delivered; two-blade beater, 1/2-inch top setting, 1-inch bottom setting, beater speed 1,200 r.p.m.; finisher picker, 14-ounce lap fed, 14-ounce lap delivered, Kirschner beater, speed 900 r.p.m.; setting 3/8-inch top and 7/8-inch bottom of grid bars to beater.

Using a 14-ounce lap and producing a 52-grain sliver on the card would give a draft of 113, allowing five per cent for card waste. The card settings would depend a great deal upon the make and condition of the card and the grade of cotton run. A 55-grain sliver delivered on the breaker drawing and a 60-grain sliver delivered on the finisher drawing would give good drafts. Drafting 4.1 on the slubber would give a .55-hank slubber roving and a good draft. Drafting 5.4 on the intermediate frames would give a good draft and 1.40-hank roving delivered. Drafting 6.0 on the speeder gives 4.10-hank roving. All of these allow for contraction in twisting. Two 4.10-hank

rovings fed in the spinning will give a good 20s to 24s yarn, using double roving in the spinning, with a draft from 10.2 to 12.2, allowing four per cent for contraction in the yarn.

If single roving is wanted in the spinning, use 16-ounce lap through the pickers, 55-grain sliver on the card, 65-grain sliver on the breaker and finisher drawing. The slubber should make .50 hank, the intermediate 1.10 hank and the fine frames should make 2.60 hank roving. This will give a draft of 8 for 20s yarn and 9.6 for 24s yarn in the spinning. All settings in frames should be ⅛ inch over the staple and in the spinning 1/16 inch over the staple.

R. J. W. (N. C.)

EDITOR COTTON:

We are making 24s yarn from the lay-out given below and find that we are getting a breaking strength of about 65 pounds. I trust it may be of help to "Contributor No. 31."

Lap, 15 ounces; card sliver, 60-grain; second drawing, 65-grain; slubber, .47 hank roving; intermediate, 1.10 hank roving; speeder, 3.00 hank roving; warp yarn, 24s.

B. R. B. (S .C.)

An Old-Timer Says—

(*Continued from page* 831.)

"Fine, my good friend. How are you? And what in Sam Hill are you doing in that town?"

"Oh, I am here looking at a bigger job than the one I have."

"Good for you. I hope you make a success with it."

"But hold on, 'Old Timer,' that's what I want to talk to you about. I haven't taken the job, and although it is a much better salary than I am now getting, I am getting along nicely where I am, the boss is a fine fellow, seems to appreciate my work very well and I believe I will just stick to what I have awhile longer and see if something don't come open with my present employers."

"Now that is pretty good sense, my good friend; you thank the people for the courtesies shown you and go back home and make yourself so valuable to your present employer that when an opening does come you will be sure to get it."

That young man would not place the next step on ground that he did not feel was a firm foundation—he is going to climb the *sure way* and the very fact that he showed good judgment in that case proves beyond a doubt that he *will* climb, and when he gets up there he will "stick." He will not get careless and lose all that it has taken him years to acquire.

Let me repeat: I will give you that big job—I will give you the farm—the home—the automobile—Yes, I will give you *Success.*

So, after all, I am your best friend, even if you do treat me so badly sometimes, and it would be good judgment on your part if you would be a little more careful about how you take care of me—Treat me as your conscience tells you—

Well, who in the devil are you, to make these big promises?

Oh! I thought you knew all the time.

I AM YOUR PRESENT JOB.

How Can This Strength Be Improved?

EDTOR COTTON:

Will you kindly have some of the readers of COTTON inform me, through "How Other Men Manage," as to the best way of improving the breaking strength of the yarn produced by Whitin two-bank condenser cards and Whitin wool spinning frames? On the spinning frames the front steel roller and spindle are running at maximum speed.

At present we are using 80 per cent card sweepings with 20 per cent local short staple cotton. This gives a yarn with strength constant of 800, and we wish it to be 900. We run 2s to 6s inclusive.

How may we improve the strength constant without increasing the percentage of local short staple cotton?

CONTRIBUTOR No. 925.

Lime vs. Caustic and Their Relation to Breaking Strength in Bleaching.

EDITOR COTTON:

In reply to "G. R. F.," I would say that *all* goods lose in weight in bleaching from five to ten per cent. This is due to the loss in bleaching of five to ten per cent of extraneous matters in the cotton. If the cotton is bleached right, this is the only loss and the cellulose, i.e., the raw cotton, is left intact, and is therefore the same strength, or nearly so, as before. With regards to piece goods, and in fact *all* goods, the stretch must be taken into account.

It must be remembered that the cotton fiber in the raw state contains impurities such as "cotton wax," coloring matters, pectic matter, etc. Further impurities (starch, flour, fatty matter, China clay, etc.) are added during the different processes of spinning, sizing and weaving, etc. It is the object of bleaching to destroy all these impurities, i.e., to decolorize the coloring matters and to remove the other impurities and leave the cellulose intact.

The operation of bleaching may be divided into two different parts which are distinct from each other, (1) the boiling of the material, upon which largely depends the weight, the main object of this is to saponify and soften certain impurities which are then partly removed in the washing; (2) the bleaching proper which is conducted by chloride of lime, etc., and which destroys the coloring matter by oxidation.

To most bleachers the merits of lime and soda boils have been the subjects of much discussion. It is not clear to the majority of them, wherein the advantages of the lime boil lie in comparison with the extra time and processes involved. At the same time many experienced bleachers are convinced of the superiority of the lime process and they can claim lots of advantages for it. In the mind of the writer it is the correct thing for goods that are to be finished white as it leaves them heavier, but for dyeing I rather prefer the caustic soda process. Many bleachers think that they can get a better finish on goods that have been lime boiled than on those which have been boiled with caustic soda alone. This may be true when a harsh finish is desired, as the extra weight is gained by the difference in the souring, etc.; the one thing is certain, that the danger of producing oxycelloluse by exposing the goods to the air in boiling is the same whether lime or caustic soda be used.

Regarding the lime boil, it calls for several distinct pro-

cesses. In the first place the goods are boiled with lime and water under atmospheric or increased pressure for several hours. This converts the wax and oil into lime soaps, while the pectins are changed at the same time into soluble compounds, and the tannins into calcium tannates. After the lime boil the goods are washed in a washing machine or otherwise, and then soured in a solution of sulphuric or hydrochloride acid at about two degrees Tw. This has the effect of decomposing the lime compounds, leaving free fatty and pectic acids on the fabrics, while the liberated tannic acids go into the solution. The soured goods are again washed and returned to the kier, where they are now boiled with a solution of sodium carbonate, sodium hydrate and, in the case of white finish goods especially, with the addition of some resin or resin soap. After boiling they are well washed again into chemic at ¼ to ½ degree Tw., allowed to lie in this some hours, and soured with sulphuric acid or a mixture of sulphuric and hydrochloric acid which is best. After lying in this for some time they are washed and finished.

In the soda boil the goods are impregnated with a dilute solution of caustic soda (two per cent) and packed in the kier. Sufficient of the soda solution is then added to cover them and they are boiled, they are then soured, washed, boiled again in soda, if necessary, washed, soured and washed.

The lime boil is the process generally adopted in the Old Country for the "market" and the "madder bleach," the latter term being applied when the most thorough bottoming and the avoidance of over-bleaching are concerned.

For "market bleach goods," i.e., those that are finished in a white state for the market must be heavy and white to *stay white,* therefore they are boiled in low pressure kiers and soured with sulphuric acid.

For "madder bleach" they are boiled in high pressure kiers ten hours and soured in hydrochloric acid so far as the lime is concerned and boiled in the mixed sodium and resin so far the second boil is concerned, and the final white sour must be hydrochloric acid alone. Resin soap is essential in the soda boil in *all* lime boils.

The caustic soda style of bleach is used on all dyed goods or goods for dyeing. It does not saponify so well, and it requires better circulation, but it is easier to use and for plants who do not care whether their goods are *good* or not, it does very well. If both the lime and caustic systems of bleaching are conducted properly and are placed side by side, there will be little difference in weight between them, the liming will be heavier, but the soda will be softer and more spongy. For myself, I prefer the caustic soda system for dyed goods, and the lime system for "market" goods or the "madder bleach." W. B. (MAINE)

EDITOR COTTON:

In reply to your correspondent who inquires concerning the breaking strength of a piece of cloth before and after bleaching, will say that in an extended experience in manufacturing and finishing, I have never seen a piece of bleached cloth that would break as strong as it would in the grey.

There is absolutely no strengthening properties in lime bleach, caustic bleach or peroxide bleach, as all of these chemicals remove strength from the grey goods.

There is an opinion prevalent among some of the wholesale jobbing trade that bleached cloth is stronger than grey, but this is only brought about by the cloth being treated with starches, gums, and other compounds *after* the cloth has left the bleach house, and it is possible by the addition of these ingredients to make the bleached cloth stronger than it was in the grey state.

But likewise, if the grey cloth had been given this same treatment of gums, starches, etc., its strength would have been increased also. CONTRIBUTOR NO. 643.

EDITOR COTTON:

In response to the inquiry concerning the difference of breaking strength of cloth in the grey and bleached, and also which produces the better white and the stronger goods, the lime or peroxide bleach—with reference to the latter part, will say this is simply a case of manipulation. The lime bleach produces as good a white and perhaps a better white than the peroxide bleach. Regarding the strength, if the chlorine in the lime bleach is properly neutralized by the use of a neutralizer, there is no question but what the goods will be stronger than the peroxide bleach, and the goods will command a premium in the wholesale market.

On the other hand, if there is any chlorine unneutralized and left in the goods, this chlorine will slowly weaken the cotton, and in that case, the peroxide would certainly be stronger. Therefore, the best results are obtained from the lime bleach if the chlorine is thoroughly neutralized. The presence or absence of chlorine before or after neutralization can readily be tested with chlorine testing papers.

CONTRIBUTOR NO. 722.

A Fly Frame Problem.

EDITOR COTTON:

Here is a card room problem upon which the help of the readers of "How Other Men Manage" will be appreciated. The frames in our card room are of a very old model of Woonsocket and Pettee make. I have several good men in that room who have been right here for 15 to 20 years and they all say that none of these speeders or intermediates have ever been tensioned properly since they have been here.

We are running 2.00 hank roving on the intermediates, and 5.43 on the warp speeders and 6.94 on the filling speeders, from 1-inch middling cotton. One side of the card room is only fifteen feet from the bank of a canal leading to the water-wheel, and on the other side the floor is several feet below the surface of the ground. I do not use humidifiers in the card room.

Our trouble seems to be that the work is too loose on the start of every doff, with empty bobbins, and then very good until about an hour before the doff; then it is too tight, it stretches the roving and must be let off. I have examined my belts, cones and racks, and they all seem to be in very good shape, although the cones may be more worn at certain places than at others but it is invisible to the feel and the eye, and as I have no way of measuring I cannot say. The tensions all work irregularly, that is, loose on the start, for about an hour then all right until about an hour before doffing, then it is too tight. It is that way with any tension gear I put on.

As it takes a very skilled frame-hand to take up or let

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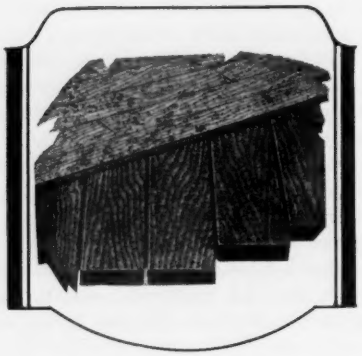

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off without making a bad bobbin, I would like to overcome that trouble, and, another thing: I have had experience at several mills, and I notice that the card rooms all run worse during "dog days," but our work on a hot damp day, and on wet days in the winter, just will not run, but just as soon as it clears off it will run and does run as good as any card room anywhere.

I would also like to know what weights the readers would recommend for the rolls on our frames.

G. D. S. (S. C.)

What Causes the Ends to Break?

EDITOR COTTON:

I should like to put a question up for discussion in the "How Other Men Manage" department.

I am running 6s to 14s warp, and have a 7-inch traverse, with 2 1/16-inch rings. The gauge of the frame is 3-inch, warp wind. I have trouble with the ends coming down after the frame is half full or over. They frazzle out and catch on the next bobbins, making the thread look fuzzy. I will appreciate it if some of your readers can give me some suggestions as to what is causing the trouble.

Y. S. (GA.)

Colored Dress Goods Warp Preparation.

EDITOR COTTON:

The importance of warp preparation is a great factor in the manufacture of colored cotton goods, such as ginghams, oxfords, and various dress goods, where level colors and good weaving are required.

The costs of the system must be studied from the weaving point of view, that is, the warp that gives the greatest length of cloth combined with good cover, strength and production from the loom.

A system that will leave strength and elasticity in the yarn and consequently counts calculated, onto the weaver's beam, is bound to pay a manufacturer. Also from the salesman's point of view, he has a better article to sell than his competitor who keeps to the older systems.

We have evolved from the old system which was in vogue many years ago, of reeling from the cop and ring, into hanks or skeins, dyeing and sizing in vat or tub according to the color required, winding onto a warper bobbin by means of the drum winding machine, warping by the circular (horizontal and vertical) mill, balling by hand from this mill and winding the warp onto a weaver's beam through a wire or wooden reed in half beers of any count from four to twenty ends, using a rod to open up and separate the ends in the verge lease.

The sectional warping machine came into use with the same method of winding and creeling the patterns, as in the circular mill system, onto the sectional machine. The ends were run over a marking roller onto a block of wood similar to a section of a beam roller which could be made to expand to nearly double its size when closed, such as from 2 to 3½ inches and 4 to 7½ inches, and so on; just as the pattern or width of beam suited the operator, who was guided by the quickest method of doing his work and by the width of the beam required for the warp he was making. It derived its name from each block making a section of a warp; for example, if there were 32 patterns across a piece of cloth 32 inches wide, 2,400 ends required, then the warper would probably creel four patterns or 300 ends in all, making eight blocks or sections, which would then be placed onto a shaft of a machine called a re-beaming frame, which was simple in construction, consisting of a shaft with two flanges, movable, threaded at one end to allow the sections to be screwed tightly and opposite a winding arrangement for the beam. After the warp had been tied to the weaver's beam, tension was placed on the warp by means of a brake consisting of a pulley and strap, weighted as became necessary.

The system carried for years. It was costly both in time and the amount of space occupied by machinery. Waste and broken yarn or lost ends were another factor which made manufacturers seek other and more up-to-date methods.

One source of trouble was soft yarn and unequal tension across the warp.

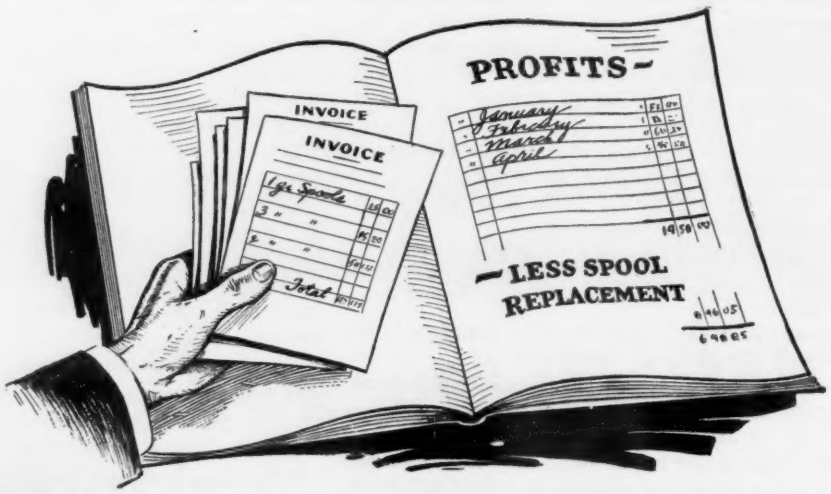
Then followed the Yorkshire system of warp dressing, which was a great improvement on the old systems.

The warps were made from grey yarn after being spooled from the cop or ring, made on the circular mill aforementioned, from particulars supplied from the weaving department, balled and dyed or bleached on warp dyeing or bleaching machinery, then sent into the preparation rooms where the operator placed the ends from the lease through a reed, similar to a weaving reed only not quite so heavy, by means of hooks, the term "sleying" the pattern being used. (The pattern as woven is sleyed by this first operation.) The machine was simply a headstock, combining two and three speeds to turn the weaver's beam, the operator tieing the warp to the beam after "sleying." Then on the power turning the beam, the warp was wound onto it, passing through the reed no more than four ends per dent or space, a rod running a few inches from the reed nearest to the beam to separate each end and which formed at the finish of the process part of the lease. The warps were run around the machine from the ball which was generally split up the center of the ends and coiled, to facilitate progress and to take out any twist in the rope-like form of the warp. They gradually opened out until reaching the reed, which spread the ends out in one sheet the width of the beam required, which was regulated by the number of ends and counts of reed used.

By this method each end could be pieced and the pattern was made exactly as woven in the cloth. The operator used a brush five inches wide and thirty-eight inches long or thereabouts to straighten out and ease the yarn in the passage through the reed, keeping a lookout for broken ends and piecing up the same. Then on completion of the method of winding the warp onto the beam, he leased every end, using the open or verge lease which had run through the warp by means of the rod placed behind the reed.

This method of warp preparation for the loom was much superior to the old systems, but it had these disadvantages: (1) The operator brushed a great amount of size and fiber from the warp; (2) and the warp being constantly on the stretch or at tension, by means of drag rollers and rails, the tensile strength and much of the elasticity was taken from the yarn.

The difference in cost was very little, if any; that is, in the working of the yarn. The difference was, say in the case of a manufacturer who bought his yarns from a spin-



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ner, he could save in floor space, less costly machinery, a smaller number of operatives, and consequently less taxes and insurance. Also he could buy his yarn exactly as necessary from particulars wanted, there being no necessity for making an allowance for waste, as all was bought ready warped.

Latterly, we had the system of dry slashing or taping where warps are made into chains or cross-balls in the warping department, sent to the bleachery or dyehouse according to plan, then run onto a beam by means of a machine acting somewhat similar to the beam warper, only direct driven instead of by friction by means of a drum. The tension is by means of rollers, just giving the necessary "hardness" to the warp on the beam. The colors are run separately onto a beam, a set comprising say from two to ten beams according to the number of colors and ends required.

These latter being the deciding factors, for from experience the highest number suitable for good work is about 500 to 550. More can be run, say 720, but bad beaming and time lost does not pay.

It is the experience of the writer that better work, output and consequently better taping on the dry machine can be had than if using a greater number of ends on the beaming frames.

It is this system I will deal more fully with, and which I personally prefer to all others for the colored goods trade. We will take as an example that we have received an order for 15,000 yards of check gingham, 32 inches wide, in 50-yard pieces, which on analysis for warp, we find is made of 36s double rove, 2,720 ends pattern, 24 white, 24 heliotrope. The warp pattern would be 6 white 50s/2 and 10 white 36s for selvage; 12 white, 24 heliotrope, 12 white for 56 times, and 10 white 36s and 6 white 50s for selvage, making the total of 2,720 ends. And 1,364 ends of 36s white, 1,344 ends of 36s heliotrope, and 12 ends of 50s/2 white equal 2,720 ends.

The 12 ends of 50s/2 would be run from the taper creel from bobbins or cheeses.

We should proceed to make out warper particulars, presuming the shrinkage from warp to cloth would be say five per cent (these figures are taken from actual mill experience). We should then make the chains or cross balls into two lengths of 7,500 yards plus five per cent for shrinkage, plus ten yards for "gaiting" or starting the warp on the dry taper. In this case we should make:

2 chains 455 ends } 1364 36 DR 7,835 yards for white.
1 chain 454 ends }
3 chains 488 ends 1344 36 DR 7,885 yards for heliotrope.

Some manufacturers order their warps for white slightly longer than those for colors, but I have found in practice when one has a bleacher who knows his business that the lengths generally work out level when colors and white are ordered the same length. Of course there are slight variations, just as colors vary according to the character and method of dyeing.

It must be stated on the warper particulars that all warps must be leased about every 500 yards or about the fifth cut if cuts are marked say 105 yards; for in case of accidents in the bleach, dyeing or beaming rooms, the beamer will have a chance to straighten the warp up without having to run the whole length under difficulties apart from loss of time.

The cross-balls are then sent to the bleach or dye house to undergo their various processes, afterwards they are plaited into a sheet, not made into a ball, for this puts in a twist in the rope-like form of the warp which is a source of trouble to the beamer.

The warp is then placed on a revolving table in the center of the beaming frame, the starting end is taken through a guide fastened to the floor, through a tension roller placed underneath the warp beam, up the front of the machine, through tension and opening rails, across overhead to the rear of the machine where a series of rollers mounted in guide rods take up the slack, or in case of a snarl in the bulk of the warp, they act somewhat similar to the drop-rollers in a beam warper. To illustrate the method, there is one roller over which the yarn passes, it is fixed in a bracket or carriage which when released immediately slides to the top of the guide posts which may be five or six yards in height. There are two rollers fixed on the guide posts at a height corresponding to the delivery of the yarn to the reed above the beam, the sliding roller lying in between the two when not in use, the yarn is taken under the two fixed rollers and over the sliding one, which, immediately on the beam's being unwound, rises to the top, therefore keeping the warp at a tension, allowing 12 or more yards to be unwound for the process of piecing or finding a lost end. Also as it is generally when in operation, running slightly away from its station, immediately a snarl occurs it gives warning by becoming tight similar to a fixed roller.

The idea of having the warp to run in front of the beam is to enable the operator to feel any sudden check caused by "snags" or the warp becoming fast, by allowing it to run slightly through her left hand. She can then stop the machine and so save a smash.

The sliding roller is controlled by a wire rope and weight which can be adjusted according to the number of ends and strength of the warp. After leaving the guide roller, the warp is then in four or five splits to the width of the opening "raith" or reed, which is made of wire teeth in a wooden frame, with a movable top. The warp passes through this mostly two ends in a dent. The raith is suspended from overhead by means of a cord at each end, so that it can swing backward or forward to facilitate the opening of the warp. It then passes through an expanding comb which is a fixture. This comb is exactly as used on the beam warper. The ends pass through no more than one in a dent.

The machine is driven by means of a sleeve and plate clutch operated by a foot pedal, which on release by the foot immediately stops the machine.

The beam is driven by two clutches, one for high and one for low speed, which turn an arm and stud, which engages on the collar of the beam. These clutches are positive, being changed for speed by means of a handle centered over the headstock.

It is essential to have one's beamers well-trained, alertness and carefulness are necessary, every end must be pieced carefully, no long "tails" to the knots, all slack ends to be taken out, in case of the beam having to be unwound to find a lost end the operator must see that it is on its own round. Experience will soon teach one which is right.

There must not be any piecing up with other counts, say in case of an end which has run out or being broken and lost by warping onto the rollers in the dyehouse. It is

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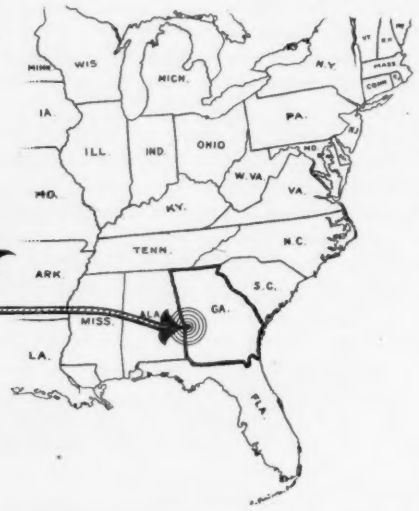

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a good idea to order one or two ends of each color over when warping, so that the operator can make small piecing bobbins. These are always useful for the weavers afterwards in case of a smash, being of the same warp and color. Attachments are sold for this purpose with all machines. It is a good idea when laying the warp in the expanding comb to leave an empty dent between the first two ends and the last two ends, so that when the warp is running onto the beam, allow the outside end to touch the flange. This gives a good side for dry taping, there is no slack, the sides just pulling on the tight side. It is essential to see all flanges are perfectly straight.

It is a common sight in most slashing rooms to see slack sides, causing broken ends and stoppages and making a bad selvage for the weaver, "traps," etc., etc.

As these machines are operated by means of foot pedal, it is essential to train the operator to keep to the front of the machine except when absolutely necessary, as in the case of a smash.

In the case of the machines I have in mind—made by A. B. White & Sons, Ltd., Colne, Lancashire, England, and the Chosley Beaming Co., Ltd., Lancashire, England—it is not necessary to leave the front of the machine except in a few cases. The operator, in the case of a smash, can pick a lease temporarily to enable him or her to run the lease placed every 500 yards, and then straighten up every misplaced end to its original position. On completion of the warp, the operator strikes a comb of say 30 dents per inch through the warp, this will keep the warp straight and spread to its width, every end being in its place. It is not absolutely necessary to lease every beam unless being made for stock. The beams, when the set is complete, are placed in the creel of the taping machine, which is different from the wet slasher creel. Each bracket is set just sufficient to allow the yarn in unwinding to clear the next beam, so that, say in a creel of ten beams, the furtherest from the machine would be, say, four feet six inches from the floor and the first beam, nearest to the machine, would be about fifteen inches.

The yarn is drawn direct from the beams into the dividing rods, not under and over as is done when slashing grey yarn. The separator rods are set at an angle similar to the beams in the creel. If the ends are kept separate and in a spread as mentioned previously by means of a loomer's comb, they can then be placed in a frame over the expanding comb which allows the operator to lay in the pattern straight and to enable him to take the ends equal from each beam. It is essential in cases of more colors to place the predominant or ground color at the bottom, commencing at No. 1 beam in the creel. As the expanding comb is movable or reversible on most machines, one can place it so that the teeth are facing the operator and not upwards as when the machine is running.

On completion of laying in the pattern, place a cap on the comb to stop any ends from being lifted out of place during the process of fixing the warp through the flannel and marking rollers.

In a case where there are three, four or five colors, and the ends of each color are not sufficient to run separately onto a beam, say 54 ends of black, 70 ends of red, and 160 ends of sky, one would imagine the best plan to run these ends onto one beam in the pattern order as they stood in the whole design. In practice this is not a success, for the red may have been stretched and lost count in its dyeing process, as also the sky to a lesser degree, all depending on the dye and process. The black, if a sulphur, owing to its harsher tone, would build up quicker than the two former colors, consequently in re-beaming the various ends would be slack or tight, impeding the operator, causing "licking" of ends in taping, and a bad appearance in the cloth when woven, also causing much trouble to the weaver.

In such a case, where the ends in the pattern occur just for ornamention and are not sufficient to make a separate beam of each color it is a good idea to order these small numbers of ends, where one has a range of patterns and each or some have the same colors, in one warp, and in the beaming use two, three or even sections made according to plan or they can be bought. They are similar to a large bobbin or small beam having a flange at each end. The ends being dented in the comb so as to leave a space where the flanges occur. These sections or splits can then be used when necessary, they save time in splitting warps and also make good taping, no slack or "licking" ends; all that is necessary is a shaft to carry them for the taper's creel.

The system of "dry slashing" is being used extensively in the colored trade of England where lengths are short in comparison to the grey trade. Even in mills where warps of each design are only 700 yards long, they use this system in preference to the others. It does not cost less than dressing say under 2,000 yards per design in actual price paid for wages in preparation, but the manufacturer gains in the following manner:

He has less trouble with his operatives, warp dressers being notoriously troublesome in their demands, especially where a mill was solely equipped for Yorkshire dressing, but since this system—dry taping—came into use, the warp dressers' union reduced the price from 19 to 30 per cent, according to the length of warp and number of ends. If they are to run chains, the short warp price to remain as it stands.

But still the process has the advantage. In cases where a mild finish (salts, etc.) were necessary for the sale of these goods, the necessary "feel" has been left in the goods by means of this process, the size not being brushed out. One notices brighter colors, better cover, more production per loom, consequently more wages for the weaver, and a superior cloth delivered in the cloth room.

The costs of manufacture are less. In several tests the writer made, the length of cloth received from a given length of warp was greater in the case of a "dry taped" warp than in one made by the other systems, especially the Yorkshire dressing system.

As at present when margins are so low, as in England, this system has meant the difference between profit and loss for several manufacturers, as the writer knows personally.

I should seriously advise anyone interested not to be tempted to interfere with the quality of the yarn he was making or buying when he found out he could get better results from his system, or he would soon be back onto his former costs again. The difference in the cost of preparation as between Yorkshire dressing and "dry taping" in the case of the ginghams mentioned above was 45 per cent in favor of the dry taping.

Other systems are spool dyeing and beam dyeing. The system of dyeing on spools where the yarn is wound onto a special spool and dyed under pressure is, for brilliancy

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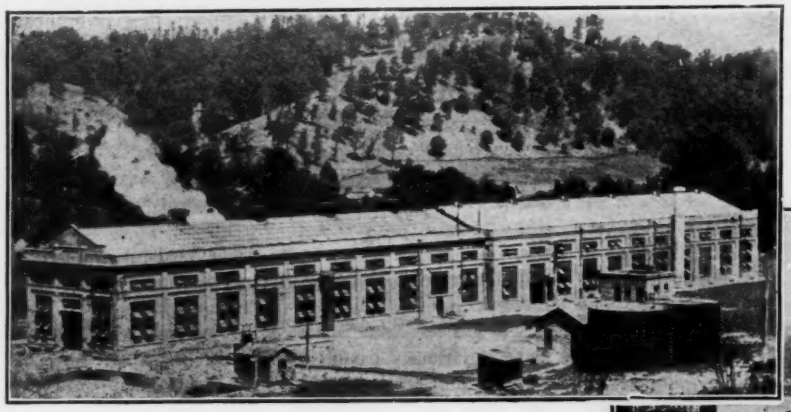

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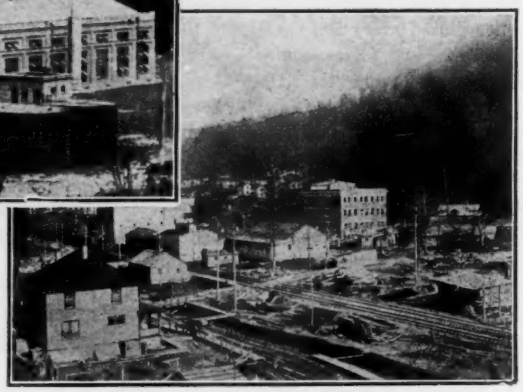

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of colors, one of the ideal processes, but, in my opinion, the cost of dyeing and the cost of warping and slashing afterwards is greater than the cost of making the warps by means of the dry taping system. Also one is not always sure of the results of the dyeing. Also the yarn is more under the control of each operator than in the spool dyeing system. Also the system of wet slashing afterwards, especially in fine yarns, does not lend itself to as great a production and correct method of placing the yarn onto the weaver's beam for good weaving.

For weft or filling yarns, it is a good method, but for cheapness, cop dyeing and in special colors or cloth, rewinding by means of the "Universal" or "Schweiter" machines is ideal, the production in the loom being greater from re-wound cops or cheeses than cops dyed and used direct, also the yarn is inspected and all shady yarn eliminated.

One of the best systems to my knowledge is the dyeing of mule cops spun twist cop size, which are re-wound onto pirn bobbins, less waste is made than by the weft cop as there is two or three times the amount on the larger cop, less handling preparatory to the dyeing and winding than in spooling.

In England the system of dyeing in cop is practically perfect, shady dyeing is now practically non-existent. Indigoes, vat, direct, sulphur and developed colors can be run quickly through the process, and if the spinning is good there is very little waste. The system of dyeing raw cotton and spinning afterwards onto tubes is used, but not extensively. One must have bulk weight to make a success of that system; then again, the costs of spinning are greater than in spinning from the grey. For white, all cops are packed and bleached, placed in cotton cloth bags, and in most cases a small wood peg is inserted at the base of the cop to enable the weaver or winder to skewer the cop without stabbing. Good bleaching should never reduce the weight more than ten or eleven per cent, nor should it tender the yarn. Good water and good scouring are essential.

Cloths made from yarns bleached and dyed in the yarns are much superior in "feel" and wear to cloth woven in the grey and bleached in the croft. (I am speaking of cloths made with stripes of fast colors, which in my opinion would be cheaper to produce in the grey and bleach afterwards, but if "feel" and wear are essential, then bleached yarn would be my preference. There isn't the stretch taken out of the cloth by that process as in cloth bleaching.) The writer has made white flannelettes of 20s warp and 10s super cop weft, "mule," and has tried the experiment of making the goods in the grey and bleaching afterwards, then napping. The cloth would not sell against the cloth bleached in the yarn and then napped; neither could the raiser get as good a nap on the cloth.

Dyeing filling made in warp form is another system, and is suitable where solid colors or large checks are made. The warps being made on the cross-baller machine and after dyeing are wound onto a beam and then wound onto pirns by a machine having about 400 spindles in tiers.

Beam dyeing has come much to the front in these last few years. It is probably used more extensively in the United States than in England. I do not think this is on account of the conservatism of the English manufacturer, but rather on account of the finer yarns that are made in

Mathews Belt Conveyer handling spindles in a large textile mill.

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The case is flexibly slung by links from three short columns on a plane through the center of gravity of the load—oscillation and vibration are minimized and there is no tendency to dance vertically. Large ball and roller bearings mounted in one removable unit housing are lubricated with grease from a single source.

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Britain, as it seems to be more successful on the coarser counts.

The secret of success in beam dyeing lies in the spooling, warping and handling during its various processes. In warping there must be even tension on the yarn throughout the entire process, perfect spooling or winding will tend to give this; less stoppages on accounts of breakages or bad bobbins. I think the idea of warping from a cone, whereas the yarn is taken from the cone at its apex instead of having to drag the bobbin around, which increases tension as the circumference lessens, will have a tendency to bring about that success. It also enables the machine to be run at a great speed, and I venture to predict will also enable the drop rollers to be dispensed with, enabling a direct drive to be used. All these factors in warping being perfected, then I think we shall be well on the way to a perfect beam for dyeing. In the layout of a mill all warpers should be situated as near as possible to the dyehouse.

The operators should be carefully trained to resist from putting any pressure on the beams by means of the knees, etc., in fact they should do all possible to refrain from handling the yarn on the beam. Then there should be a system of handling the beams, by means of an overhead conveyor, all full beams being taken to the room set apart in the dyehouse, and all beams placed on the floor separately and never one on top of another, which is commonly done in a large number of mills. This placing of one on top of another causes "flats," which makes shady places when the beam is dyed, on account of the difference in resistance to the dye which is forced through.

It is essential to have all beam heads or flanges set perfectly true, on no account must crooked flanges be used, as this may cause a good set of beams to be spoiled.

To insure even dyeing, it is essential that clean yarns be used, especially for light colors, free from husks, etc., and good scouring is necessary.

It is no use using inferior cotton containing dead or tinged fibers and then blaming the dyer.

I feel sure if manufacturers would study their methods of preparation more closely than they have in the past, they would eliminate a great number of weaving faults and also cut down their costs, therefore having a superior class of article at less cost, and at the end of the year, a better balance sheet. C. W. (CANADA)

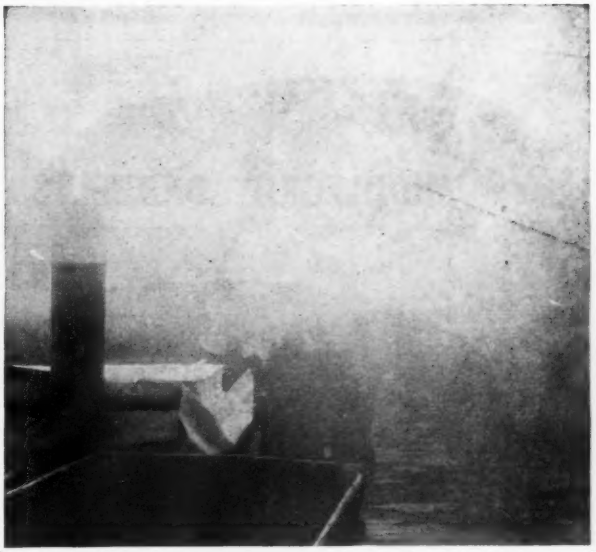
Again the Cloth Room Counters.

EDITOR COTTON:

Please allow me an answer to "Contributor No. 3649."

The boss weaver is the most perfect piece of humanity in a mill; or is he? If he makes thin places he is getting bad filling—not doffed right nor spun right, and the carder never got all the motes out, or any other pesky thing that he can say to pile his mishaps on someone else he will be sure to say. At least it seems so!

He says he never saw much sorry beaming in all his life. Selvages are high in one place and low in another. Loose ends on beams, that almost have rat nests in them. If the beaming is about to get ahead of him, he will get the slasher man to get sick and lay off in order to block beaming. If production is low he waited on filling or the beaming work. If anyone hires any help for him the help



This Condition Costs Money

Wherever a bleachery or dyehouse operates under conditions like these the owners are paying out money for spoilage, repairs and low production far in excess of their own knowledge.

When we visit one of these plants and tell the operating executives that we can absolutely clear the atmosphere, they are inclined to be skeptical. When we tell them of the saving effected in less spoiled goods, longer life of roofs, and increased production; and back up our statements with figures given by executives of plants where our equipment is in use; we convince them.

The Vice-President of a company where we sold two Buffalo Air Conditioning Systems in 1919 says: "Buffalo Forge Air Conditioning System in our dyehouses save $10,320.00 a year by increasing production 15%, eliminating spotted goods, and greatly lengthening the life of the roof. These Buffalo Forge Systems have completely eliminated the trouble formerly experienced. The atmosphere is now perfectly clear, and the men can work at maximum speed. Spotting of the goods is practically unknown, and the life of the roofs has been greatly increased."

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The **outer** ply is made from the famous Bondex close fibred leather which is exceptionally fine in texture. This special leather reinforces the belt, takes care of the shifter and adds greater strength.

The **under** ply, or narrower leather strip, which actually does the driving, is made from Bondural leather. Bondural leather has almost miraculous gripping powers which insures a long life to the belt, perfect cone contact and reduces slippage and the losses from uneven coning.

Both of the leathers are products from the same tannery as BONDARON, "the original textile leather with the hair on," and they make an ideal combination for efficient cone belts.

It will pay you to equip your machines with Bondex Middlegrip Cone Belts, made endless or in rolls.

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Write for Booklet 34-B.

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Jersey City, N. J.

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is too sorry to live and could not make good work in a burlap mill. If the per cent of seconds is too high the cloth room man has it in for him. Or, he could do fifty per cent better if the mill were not running at night. In fact, all the help on at night are regular tramps. The night foreman lies around and sleeps and does not try to do anything except to make seconds.

If the cloth is narrow, the spinning room overseer or the beamer took out a few ends unbeknownst to him. If the cloth room needs the cloth delivered to them he is always busy trying to please the Boss, and please leave him alone so that he can run his job.

If he has thready selvages he says, "Well, I didn't hire that loom fixer and he isn't any good." If he has bad warps he will say, "I did not hire that slasher man, therefore he is no good." If any of the office force pass through and see anything wrong he says they are trying to run his job.

If he has a second-hand he wants one the superintendent has no confidence in—afraid he will lose his job. If the night man tells him anything for the betterment of the job he will say, "Now that fool is working to get my job," and will pout for a week. In fact, everything he, himself, does is perfect, but everything anyone else does is as rotten as dirt.

Really, he is just a self-righteous creature and would not harm any grown person, while they are looking, but when they turn their back they are "sorry old makepieces."

After all, it makes me think of a dream of going to Heaven and finding a nice new mill, plenty of help and everything ready to run, but not a wheel moving. After inquiring the reason, they said no boss weavers ever came that way.

So be glad you are not a boss weaver.

C. R. M. (N. C.)

A Fly Frame Question from "Wash."

EDITOR COTTON:

In a recent issue of COTTON I made the claim that if a set of roving was creeled with the frame stopped, or creeled altogether, that in running out, a layer or two in difference would be found.

What causes the difference? Are the defenders of the bobbin-lead afraid to answer that?

Now let the defenders of the bobbin-lead explain the foregoing or admit that the bobbin-lead system is the cause for the most stretch found in the roving. WASH (R. I.)

Finishing Drab Canvas.

EDITOR COTTON:

I am enclosing a sample of duck and would appreciate receiving some information as to what would be the best way to procure the finish shown on this sample and the machinery necessary to accomplish this in the best manner.

C. E. (WIS.)

EDITOR COTTON:

Regarding "C. E.'s" inquiry, and the sample therewith, the goods will have to be bleached first presumably under the caustic bleach system. They will then want dyeing in 1,000 yard (or so) lots. The standard tub which must be made in 50-gallon size must be made up as follows, or

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For precision's sake, the process of making a Jordan Bobbin is suspended, at a stage just preceding the final operations.

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something like this: Water, 45 gallons; Glauber salt, 10 pounds; fast black, 3 ounces; Sun yellow, 4 ounces; Chicago Brown B, 5 ounces, and Monopole oil, 2 pounds. Stir up well and boil.

The machine must hold 15 pails, with hot water. Make this up with—first end—softener, 4 pounds; Glauber salt, 10 pounds, and standard from tub, 4 pails. Keep boiling.

Fresh on fourth seam (or 200 yards) with ½ pail of water and ½ pail of standard from tub.

2nd end—½ pail standard to begin, then fresh as before. Mangle without water and dry straight on cans. Starch as follows: Corn starch, 150 pounds; Epsom salts, 50 pounds; soluble oil, 20 pounds; glucose, 50 pounds, and water, 100 gallons.

Boil until thin and starch two nips. Dry on cans and straighten threads. Dry at low temperature and slowly, let lie until cool, sprinkle and let it lie two hours. Calender heavily, two nips wooden calender, or oftener if necessary and starch twice if necessary. W. B. (MAINE)

Preventing Reedy Cloth.

EDITOR COTTON:

Replying to "R. O. (S. C.)," whose question appeared in the March issue, I don't think the position of the harnesses will make much difference as to the reedy appearance of the cloth, but I do think it could be helped a great deal by raising the whip roll higher than the breast beam, and putting the lay about three inches from the fell of the cloth when the harnesses are level. A setting of this kind gives a loose top shed and the yarn, being all level with such a long beat, helps to spread the loose yarn, thereby eliminating the reedy appearance. Y. T. (CONN.)

Using the "Flat-top" Traveler.

EDITOR COTTON:

I was interested to read in the May issue of COTTON, the account of "J. A. H. (Conn.)," of how the adoption of a flat top traveler effected a benefit for him on his 50s warp yarn. This brought to mind an experience of my own many years ago with the flat top traveler. I suppose I was the first man in the South to adopt this type for an entire spinning room.

When I took charge of the room I had at that time—for I was overseer of spinning, having since become a superintendent—there was considerable trouble in the spinning, where the ordinary round top traveler was being used. Upon investigation I found my predecessor had been using too large a circle for the 40s to 44s filling being spun, and, for the 1 3/16-inch No. 1 flange rings we had, I ordered about a 14/0 No. 1 circle traveler, the regular round top type. When the travelers came, the company sent along some samples of the same weight and same circle of traveler, except that it was a flat top. Out of curiosity I tried these, and they improved conditions so much that I adopted the flat top type as standard for the room.

One of our big difficulties had been that the bottom steel rollers, being old, had burrs on them, and these burrs would have a tendency to pull the strand back, causing it to lap up around the leather rollers and damaging them.

We're in the Belt-Making Business Because We Like It

IT IS said that every person can do one thing well; that to attain the greatest measure of success each one of us should seek to discover that one thing—*and do it.*

This organization serves as an excellent example of this truth. By means of a careful process of selection and elimination we have surrounded ourselves with men who are true belt makers. They like the work . . . *it is the one thing they can do well* . . . and the result of their close cooperative effort is

MOLONEY Leather Belting

You men who are responsible for dependable belt performance will find that a "Moloney" installation means the end of transmission troubles. For Moloney Belting delivers maximum power with ease and precision; it is flexible, strong and wear-resisting; it is immune to the degenerating effects of heat, cold and dampness; and its inbred quality protects against fumes, acids and other harmful agencies.

Such belting deserves your consideration. We suggest that you try it on the hardest drive in your mill—convince yourself.

Moloney engineers are experts in the solution of belting problems. They will be glad to help you.

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Four railroads operating 11 separate lines offer ideal distribution facilities. Two direct connections to each of the six South Atlantic seaports.

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An abundant and excellent water supply is furnished by the city. Various analyses show both city and branch water is applicable for bleaching and manufacture of Rayon.

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An ideal year 'round climate of 63.5 degrees. Heat prostrations unknown and snow is extraordinary. 10½ hours of daylight on the shortest day of the year and 14 hours on the longest.

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The Industrial Bureau keeps a file of all available sites for industrial purposes and will assist you in securing a desired location.

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Textile manufacturers will find an unlimited supply of Hydro-Electric power for every purpose needed in Columbia, S. C. This is the base of super-power zones embracing the most of South Carolina and can guarantee a continuous, uninterrupted power service at a low cost to the manufacturer.

Other advantages to be found in Columbia are: An abundant supply of labor both skilled and unskilled, 100% American. An unlimited water supply which has been O.K.'d by leading textile chemists for all finishing purposes. Ideal year round climate of 63.5 degrees making possible twelve months' operation without interruptions.
1192 acres of ideal industrial sites are now available near Columbia. Connected with the city by paved highways, a double track trolley line and three railroads. Supplied by city water, sanitary sewers and telephone, telegraph and power connections.

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FRANK A. PIERSON, *Secretary.*
COLUMBIA CHAMBER OF COMMERCE

COLUMBIA

SOUTH CAROLINA

With the proper circle, and using the flat top type, however, we seemed to get just the sufficient amount of "drag" on the yarn, and this trouble was practically eliminated. The uniform and even tension produced by the flat top traveler did the trick. As a result our spinners were able to take on one more side of spindles all the way around.

I tell this experience for what it is worth, and because "J. A. H.'s" letter brought it back to my mind. I do not advocate the universal adoption of the flat top solely on the strength of this experience. As a matter of fact, I was so impressed with the way they helped me the first time, that when I took over my present mill, I ordered them for the spinning room, and they wouldn't work. But in the former instance they did me a good turn.

F. R. T. (GA.)

Gives Variation Limits on Yarn and Laps.

EDITOR COTTON:

In reply to "W. H. (N. C.)," who asks in April COTTON, what would be a reasonable amount of variation in numbers on 40s filling made from full Middling white western 1-inch cotton, would say that a maximum variation of three numbers would be considered good in sizing from a number of frames at one time. Of course, if sizings are taken in different kinds of weather (rainy and fair) more variation might be found. I have at hand right now my daily sizing report for this date, March 25th, and I am running 43½s filling and my lowest is 42.55s and my highest is 45.45s. This is the average variation that I have in my filling numbers. This is the result from sixteen sizings, and represents an average day's work.

As to his second question, on finisher laps it is both practical and convenient to allow one-half pound each way from the standard. If the standard is 40 pounds, then 40½ should be the maximum and 39½ should be the minimum If the weather is rainy or damp let the laps run on the heavy side of 40 pounds up to 41 pounds, and this helps variation some. W. R. J. (N. C.)

The accompanying illustration of a patent filling mangle should have been used in conjunction with the article "Glazed Black Cambries," on page 705 of the May issue of COTTON. Reference was made therein to the use of this

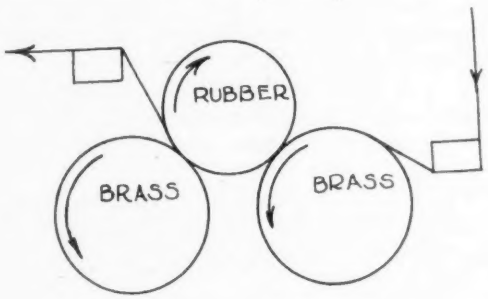

FIG. 1

machine in the filling of this material with the formula given. The illustration was omitted through error, and readers are referred to the article mentioned for its use as given therein.—The Editors.

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A Systematic Method for Reducing Waste.

EDITOR COTTON:

Waste has been, and always will be, a problem in the cotton mill. Every mill man is familiar with its importance, and in COTTON and at the discussion meetings much has been said regarding it. So far, however, I have not observed anyone giving a definite system for keeping up with it, and thus keeping it down.

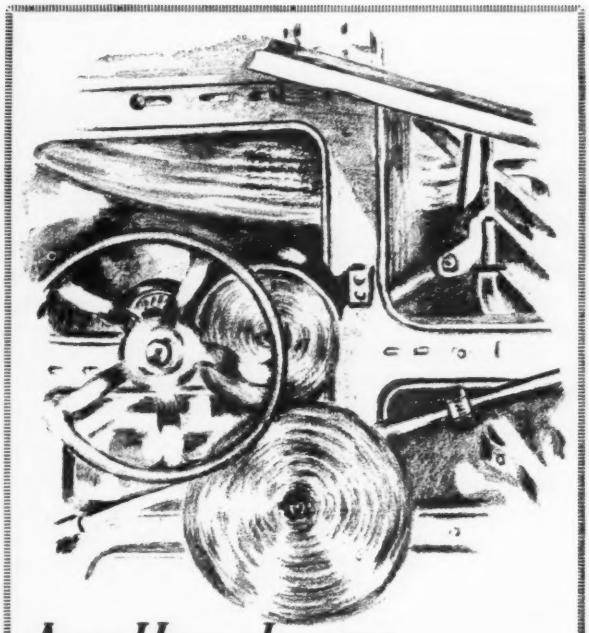
We know that by decreasing our unnecessary waste, we increase our profits. In order to accomplish the best results, four things are necessary: (a) service; (b) system; (c) records; and (d) supervision. Nothing can be accomplished without a sincere service in connection with the waste. It is just as important to have this service as it is to have service in connection with the regular manufacturing. It means hard work on the part of everybody. There must be a well established and recognized system, and with this system there must be an authentic record. The whole business must now be supervised.

In a large mill on colored goods, handling, say, over 120,000 pounds of raw material to produce 100,000 pounds of finished goods per week, there will be many kinds of waste. If such a plant should make, say, two per cent more sale waste than is necessary, on the basis of today's price of cotton, it will amount to $528.00 a week. If the mill makes on an average of three per cent more of the re-workable waste than is necessary, the cost of re-working will amount to over $250.00 per week. This is based on the re-worked waste having again to pass through at least one-third of the processes, as most of this waste drops out in the carding department. This totals up to $778.00 per week for making excessive waste. Now we must ask ourselves how much of this waste can be prevented and reclaimed, and as an offset to this, how much are we willing to spend for a thoroughly competent man to look after the waste exclusively?

We will now analyze the waste situation and show how the wastes may be reduced. Of the many kinds of waste to contend with in a colored goods mill, might be mentioned the following. Starting with the bale of raw cotton, the manufacturer is saddled with an enormous initial waste burden—Non-reclaimable: Invisible waste, such as moisture, oily or fatty matters, dust, fine short fibers which float away in the air; and material wastes: sand, leafy matter, seeds. motes and neps, etc. Then there are the salvageable material wastes, such as bagging and ties, matted cotton, various short stock or fibers, cotton sticking to the bagging.

Thus we have over a dozen different kinds of waste in a bale of cotton before it is opened. The amount of this waste depends upon the cotton purchaser, and can be reduced only by most careful buying, and also by making careful tests of what has been purchased to see what percentages of waste come from the different sources. Carefully kept records of these tests will determine which cotton is best to buy, and which is best adapted to make the goods wanted.

Following the bale of cotton through the various processes of manufacture, the following additional kinds of waste are found: lap waste, card sliver waste, drawing sliver waste, roving waste, roll waste. All of this is reworkable. Then there are soft yarn wastes, hard yarn



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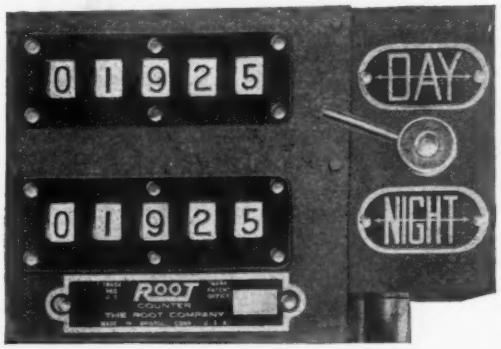

wastes, rag wastes, gray yarn wastes, bleached yarn wastes, gray rags waste, colored yarn wastes, sweepings waste, clearer waste, stripping waste, flying waste, rolling waste. This is re-workable into low-grade goods. Then there are the dangerous or inflammable wastes, oily cotton, oily yarn, oily rags, which are not re-workable.

It is practically impossible to eliminate any one of these groups, but it is possible to reduce the amount of each kind of waste made.

Toward accomplishing this end, the most important step is to have the right kind of a waste house. It is as important to have a suitable waste house as it is to have a mill office. This waste house should be large enough, conveniently located, well lighted, properly ventilated, heated in cold weather and suitably arranged inside. Some have said it should even have a dressing room, lavatory and bath room.

This waste house should be easily accessible from the departments in the mill. It should have two stories, the entrance being on the second story. On this floor should be placed sorting tables. After the wastes have been sorted inspected, classified, weighed and recorded, then these

MILL NO.....
DEPT NO.....
DATE.....

KIND OF WASTE	PROCESS	TIME GATHERED	NAME OF WASTE MAKER	WHY MADE	POUNDS AND OUNCES	VALUE AS WASTE	VALUE OF IMPROVEMENTABLE WASTE	VALUE OF PREVENTABLE IF IT WAS MADE INTO GOODS	NET LOSS	REMARKS
AVERAGES WEEKLY										
MONTHLY										
QUARTERLY										
YEARLY										

wastes may be dropped into their respective bags, the lower floor being reserved entirely for the taking down of the suspended bags, closing and shipping them.

Next in importance is the great need of placing the right kind of a man in charge of this waste house. His work will include the supervision of the gathering of the wastes and the transporting of them to the waste house. It is as important to have this head waste man as it is to have any other head man. He should be a special assistant to the superintendent, cooperating with him and the overseers by keeping them posted on all waste matters. Among a loyal organization of overseers he should be a valuable asset to their efforts at waste reducing. This special head man over waste is rendered all the more important because all of the other department heads are too busy to give this matter close enough attention.

The next thing is to have the right kind of waste stations all through the mill. All of these stations should be numbered. There should be no waste boxes anywhere in the mill. A waste box becomes nasty, filthy and vermin-ridden; it is unnecessary and is an enemy of health. Instead of the common-place ramshackle waste box into which the waste gatherer must dive to fish out the waste, there should be a system of pouches. These pouches are consecutively numbered, and there should be two sets of them. The waste gatherers will hang up one set of "empties" when they take down the partly filled ones. These pouches will be suspended on metallic hangers which hold the mouth of the pouch open. At each station there will be kept an open record of the waste gathered. This will be entered on a card held in place at each station by a suitable card holder. There must be a nicely painted waste truck. This truck starts from the waste house with one set of empty bags. The filled ones at each station are gathered, and replaced with empty bags, each one of them being marked. All the weighing is to be done at the waste house on tested scales.

The next thing is to keep everybody interested in the waste reducing game, and keep them closely posted. Each hand directly responsible for waste making, such as a spooler tender, etc., should receive, each day a ticket showing the amount of the waste made by him or her. This should be followed up weekly by a ticket showing the average weight of waste made, the value of same as waste, and its greater value if it had been made into regular goods. Reports should likewise be made to the overseers and superintendent. A form such as the one shown in the accompanying illustration might be adapted for this purpose.

The work of the waste department can be greatly enlarged and made all the more interesting and valuable by having all broken articles, such as bobbins, shuttles, spools, etc., carried to the waste house. One mill had this system and greatly reduced waste on these items. Another mill had the system but did not include the receiving of broken parts and supplies.

The whole idea of the system is to render the waste house as "wasteless" as possible. The less the waste house force has to do, the better it is for the mill. It is a case of the more time this force has to loaf, the more profit the mill can make.

All working together for the reduction of wastes will reduce not only the non-reclaimable waste, but also the reworkable wastes. This is one of the greater problems of cotton manufacturing. H. D. M. (GA.)

Top Roll Sizes and Fluting.

EDITOR COTTON:

In the March issue, in discussing fluted rolls, "L. D. (Mass.)" says something about a table of manufacturers' standard sizes of top rolls to go with various sizes of bottom rolls. I would like to add that most top rolls are made 15/16-inch diameter on the leather, the difference in rolls coming in lengths to accommoate spindle spacing. I think one can readily see why 15/16-inch was chosen by the manufacturers as a standard, because it would not be the same diameter as the fluted roll, which are usually made 7/8-inch diameter for two back rows and 1-inch for the front roll; or 1-inch for two back rows and 1⅛-inch for the front roll; thus helping to save the top rolls from becoming fluted. H. D. (MASS.)

In connection with the "Table of Organization" which was published on page 607 of the April number of COTTON and the "Production Table for Filling Yarns" that was published on page 727 of the May number of COTTON, we wish to take this opportunity to state that credit for the preparation of these tables should have been given to Lockwood, Greene & Company, Engineers. This was inadvertently omitted from the two issues mentioned.—The Editors.

The purpose to serve is the power that carries men on toward success.—*Ralph Waldo Elden.*

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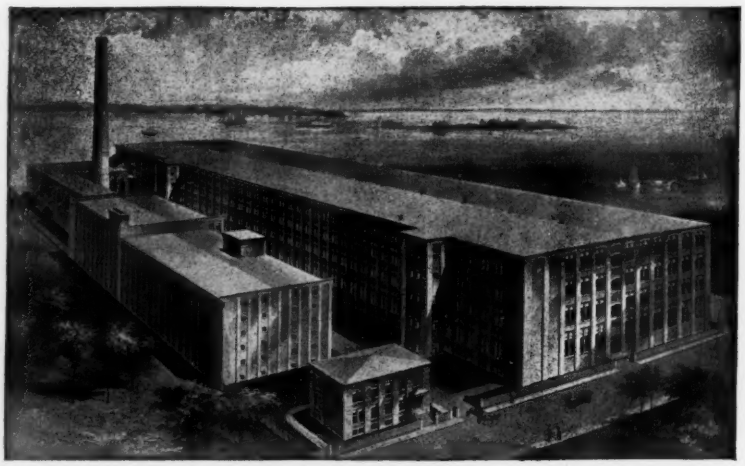

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QUISSETT MEANS QUALITY

Embroidery Effects on the Knitting Frame

BY WILLIAM DAVIS, M.A.

The Cotton's patent type of frame is one of the bulwarks of the hosiery trade and finds an honored place in the equipment of large numbers of hosiery manufacturers. It is a flat frame and is constructed to produce from 8 to 12 full width garments at one and the same time. It is primarily adapted for the full fashioned branch of the making of knitted goods. The fundamental reason for the high quality of texture in this machine is undoubtedly the use of the spring needle which gives a mesh of great density and closeness, while very close support is given by one loop to another in the fabric resulting in an ideal fabric for most purposes of knitwear. In the first place the fabric is made straight, there is no inward bias of the loops such as is found in fabric produced on the circular frame where this inward bias is most pronounced and leads undoubtedly to the great shrinkage which occurs in this type of machine from the frame to the table. The courses of loops in each division are all made in a self-contained manner and one course is thoroughly set and established in the fabric before the succeeding course of loops requires to be produced. In the circular machine, course follows on course at extremely short intervals in the circle of knitting so that the whole texture is in a state of motion and flux. In the flat frame the fabric lies at the needles to a large extent in a natural condition and there is very little pull in drawing the fabric off so that the stitch is allowed to settle down to its natural curve without violent internal strains and thrusts which have afterwards to re-adjust themselves before a stable equilibrium can be established.

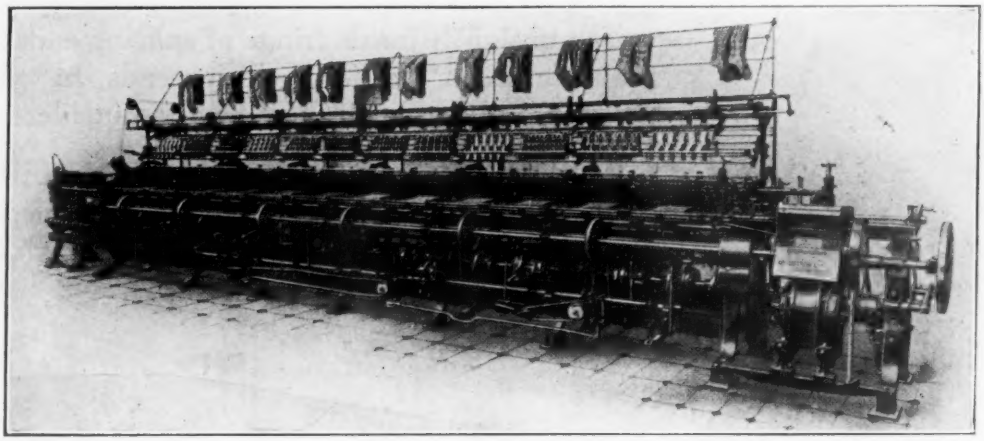

FIG. 1.

One striking deterrent to the really extensive use of this type of frame is its large initial cost which acts as a drawback to all firms except those which have plentiful capital at their call. An advantage of this machine is the accurate manner in which all styles and shapes can be produced by the aid of the fashioning tackle, every garment having individual treatment so that the pieces are produced of the correct size and shape; when a wider fabric is desired, it can be delivered with the required number of stitches actually placed there. When a reduction in the number of stitches is sought the narrowing points come into action and reduce the number of needles in work, this occurring at any angle or combination of angles to produce the desired effect with absolute accuracy. It is in the realm of ladies' garments that the frame has clearly established its superiority, for the bosom attachments required in undergarments for their use can be produced in the best possible manner on this type of machine. These flaps are now inserted without any seam being necessary along the center of the pocket, the fashioning taking place by lifting the division bodily off the needles, an increased number of points numbering between one hundred to two hundred, according to gauge, having been created to enable this to be done. Similarly in making combination garments which are a strong feature of ladies' underwear, this type of machine produces such articles completely fashioned to the complicated particulars required for garments of this class, where the principles of making the upper and nether garment in one piece are successfully combined. But it is particularly in the realm of the full-fashioned footwear that the flat machine of this character stands pre-eminent for the shape can be made exactly as required by the form of the wearer. In the stylish stocking it is desirable to clothe the limb closely at every point, particularly where the calf curves into the ankle, this being frequently very unsightly when produced on seamless machines, particularly if the wearer is of liberal proportions.

It is particularly in the direction of producing fancy patterns on this machine that we wish to treat in this article and it should be stated that for a long time back there has been, in most countries, a steady demand for articles of footwear possessing a fancy character. The ordinary machine with its extra carriers for new colors of yarn can produce the cross stripes very readily but the demand has swung round largely to those patterns where the color effect appears in the vertical direction as being more in harmony with the prevailing line of development of the human figure. In surveying a wearer you generally look him up and down and in performing this simple scrutiny

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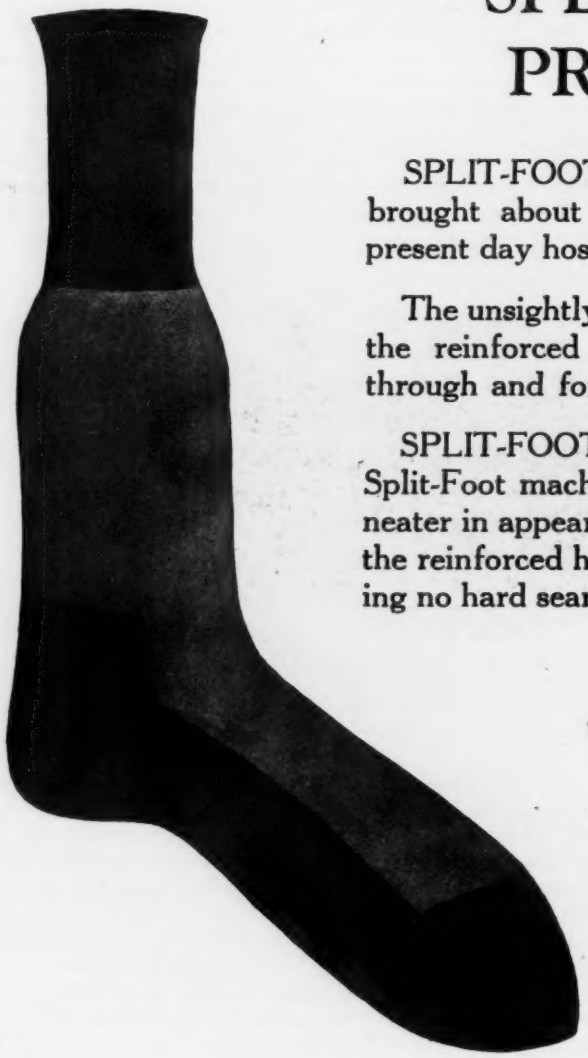

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it is preferable to have a pattern effect which will run in the same direction of the eye and thus conduce to the general harmony of the scheme of things. The cross color effect appears to interrupt the free up down action of the eye in making this survey and causes some interruption in the mental process of "taking in" your man.

Fig. 1 gives a full view of the machine used for this purpose which is a twelve-at-once fancy hose frame where the arrangements for making the vertical stripes are clearly shown in the figure, the chief feature observable being the single bobbins erected on bobbin stands on the platform above each division. These threads are arranged on the spindles on the platform in order of color desired and they are then drawn through the eyes of the guides which are placed in front of the needles. These yarns are set on the surface of the ordinary fabric as an extra and the test for their presence in comparison with other types of figuring is to draw out the fancy threads in the fabric when the ground will remain intact. If the striping is produced by other means the whole fabric will be broken down as an integral part of its constitution will have been removed in this test.

On the upper rail of the machine is displayed a range of hose where various patterns may be distinguished, stripes, checks and spot effects. On the right of the machine is shown the most recent drive which is individual in its character. This is not generally found on the present machines but is a decided advantage in obviating pulleys and belts running in connection with a main shaft. The arrangement is fitted with a clutch which enables the worker to manipulate the machine in exactly the same manner as a machine with a belt drive. This is an advantage in that workers who have obtained their experience on belt-driven machines can turn their energies to the individual driven machine without having to break off or form new habits of work.

The make-up of the guide bar and its lay-out are the most important parts of this mechanism and in Fig. 2 is given a view of the bar as it appears looking straight at the frame. This bar is set in front of the needles in such a way that it can approach the needles, swing its points through, shog to the side and return via the next needle thus laying the thread. The bar is generally set with one groove for every two needles of the machine and these grooves are provided with embroidery points marked EP in Fig. 2. The bar containing the points is supported by the arms M and the movements are obtained by cams which work at the side or the end of the frame. The shogged or side-to-side movement is obtained by means of a wheel cut with raised portions of different heights to correspond with the extent of the shog, for example, a shog of one needle space to the right would be fulfilled by a piece of height number one, a further shog of a needle space would be provided for by the occurrence of a piece of height number 2 and so on. The shogs back again on the return journey would be effected by the same heights of cam surface.

In recent machines, however, there has been a tendency to effect this sidewise movement by the use of chains containing studs of the required height to produce the shog for the Dawson wheels, as they are called. Cams are difficult to cut accurately while chains are simply made up by attaching studs of the requisite height to give the shog desired. If an embroidery point is intended to place its thread always over the same needle such as is required for solid stripes of color, then the sidewise shog is one needle space towards the right and when this is completed, the bar makes an immediate return to its starting point and repeats the same operation throughout the fabric. In this way stripes of color are made in the fabric and the solid lines of embroidery are very popular for many grades of goods. In such cases the chief method of variation is to alter the colors in the stripe and have two or more shades in the design.

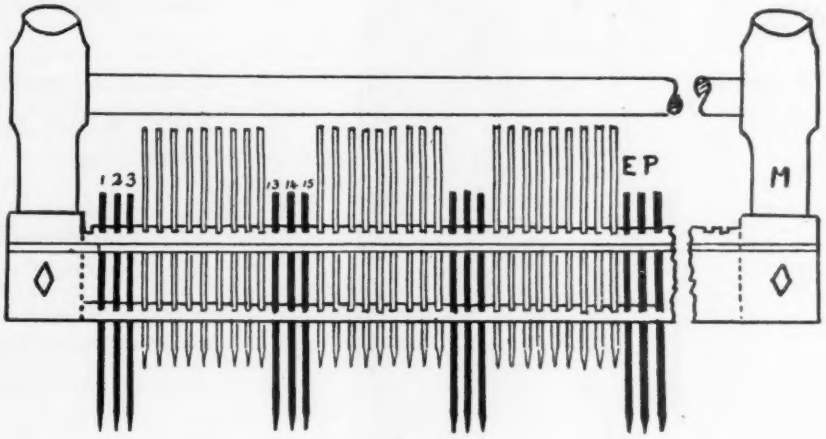
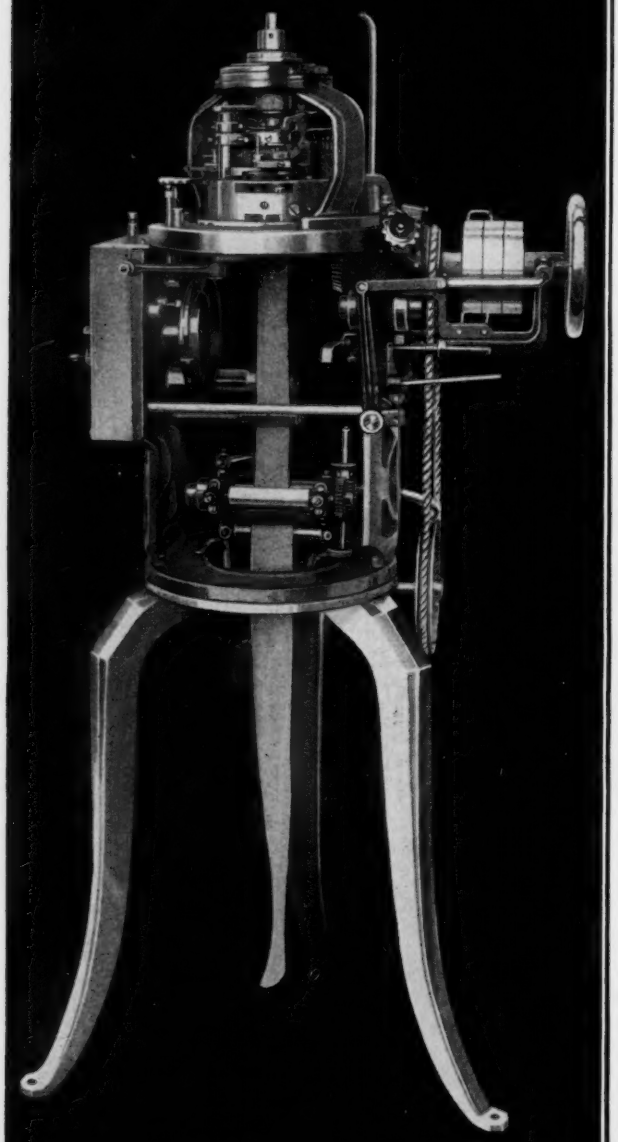


FIG. 2.

Another step is to vary the distance apart of the stripes in the fabric, and alternate double stripes with single ones. Then the arrangements of say two and two can be varied to give three and one; one, two and one and so on according to the requirement of the manufacturer. The counts and character of the yarns in such goods are rather special and it may be taken as an axiom that the size of the embroidery threads should be the smallest that is consistent with the fulfillment of the purpose. There are two reasons for this: First, in an expensive material you must secure your effect with the least possible weight so as to repress excessive costs of production; second, the pattern looks much smarter when the colors are brilliant and the size of the yarn small and neat. For such fabrics to be



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covered with thick dull threads is a serious defect for they appear clumsy and the height of the fabric at the point where the pattern threads occur is considerably raised beyond the normal which produces a kind of corrugated effect to spoil the appearance of the fabric.

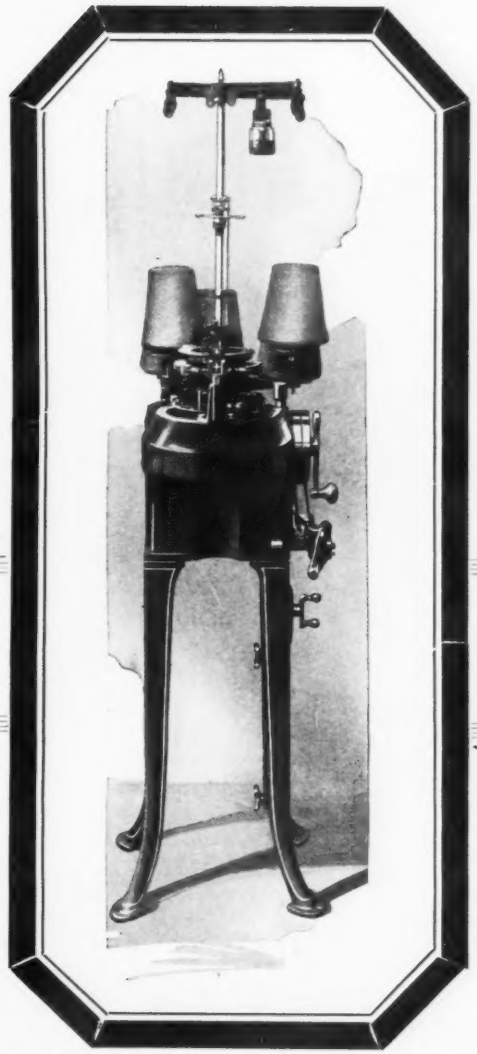
The best qualities of spun silk or mercerized cotton are usually employed and these have to be wound in the form of small spools which allow of them being placed on the platform on which the fancy yarns are accommodated. Fig. 2 further gives a view of a setout of the embroidery points in this bar which will yield a 9 and 3 pattern. Points 1, 2 and 3, 13, 14, 15, etc., are shown to be drawn down into position for lapping their threads over the needles, and this arrangement will cause the 9 intervening needles to be free from thread as shown. The points not to be used are withdrawn into the Ligher position of the embroidery point bar.

It is quite clear that this gives a wide field for variety as these points can be brought down into action in any order desired and we have a wide scope for altering the width of the stripe or of introducing two or more colors into the motive. Similarly the points are rapidly drawn up out of action when the machine is narrowing, for as the fabric moves inward the embroidery points can be drawn up out of the way. A reverse action can be quickly and easily effected when the fabric is being widened on the needles.

The next element in the figuring capacity of the machine lies in the system of shogging, and a few possibilities may be indicated, further than the solid stripes already referred to. In shogging the points to new needles on right or left, the appearance of the stitch undergoes a great change from the solid line. When the embroidery thread always rests on the same needle covering the same row of vertical loops, a solid color appears but when the points move toward the right or left, this gives place to the V-shaped loop which is rather more ornamental. A common form of pattern is composed of a sidewise movement of the points say five or six towards the right after which the points are made to retrace their path towards the left back to start. These vertical zig-zag effects are not very popular at present, the demand for stripes and checks being more pronounced. If the threads are placed together in bunches of six or eight and made to work over the same needles for a given number of courses after which they are withdrawn from working on the needles for a similar distance, when they are re-introduced, this gives a check effect in the fabric. If this is accompanied by a sidewise movement of several points according to the lay-out of the design, an alternate check can be obtained. Then the side to side movement can be combined with a straight vertical effect to give a pattern of a more fancy character.

To produce solid effects in such cases, it is necessary to have facilities for making the embroidery threads work on every needle if required, in which case the sett of the grooves in the point bar is made the same as the machine and the points can be filled with threads to the width of the stripe or check and an area of fabric covered as desired by the dimension of the pattern.

Now these patterns are more or less sterotyped after a while, for although a large number of variations are possible, they have, to the casual observer, a general similarity of aspect which begins to pall. This has caused the jacquard attachment to be made to this machine where the individual points of the guide bar can be brought into



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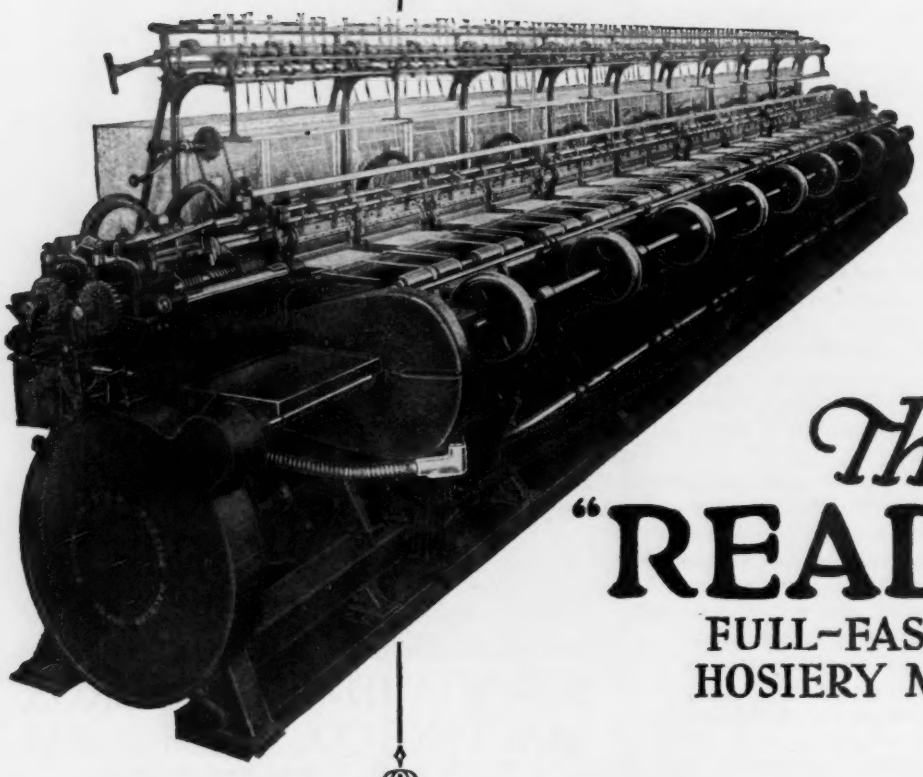


The "READING"
FULL-FASHIONED
HOSIERY MACHINE

xetion over any needle desired. This involves a considerable addition to the tackle of the machine and consequently increases its cost but it has rendered possible a very great extension in pattern scope and these patterns have met with a ready demand on the market for hose and for other purposes. Manufacturers who have installed those jacquard embroidery machines are able to secure a virtual monopoly in certain lines of goods and can recoup themselves in a comparatively short period for the large initial outlay as they are not assailed with such fierce competition as is the case in normal branches of the hosiery trade.

Figure 3 gives a view of a pattern of a style which has experienced a very large demand in recent seasons for hose

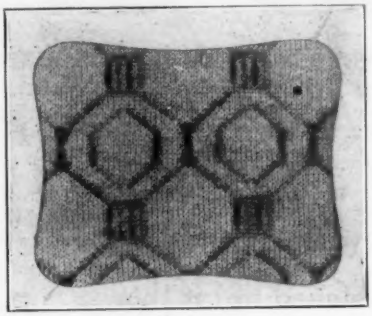


FIG. 3.

and half-hose and this shows the combination of the vertical line of pattern with a side-to-side movement of the guide bars; one set moves towards the right and back again, and the other set towards the left and back again, these two contrary movements combining to produce the very attractive and popular diamond style of pattern. In the stripe

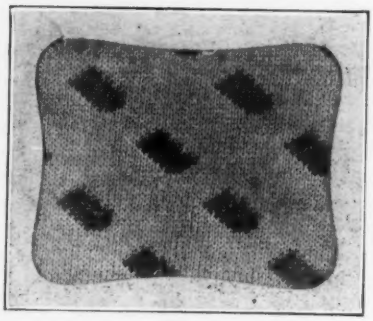
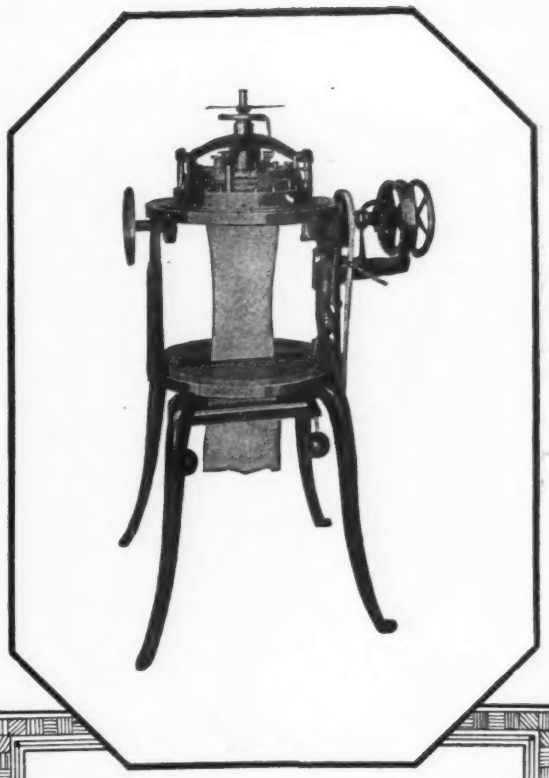


FIG. 4.

portion the pattern is one green, one purple and the alternate ground white shows up in suitable contrast. The sidewise movement referred to consists of a step of six towards the right and back again. The material used is in a very fine count and the cost of the embroidery is almost negligible so effective is it.

In production this special attachment retards the normal output of the frame and in practice it is not general to attach the pattern at every part of the hose but only at those portions which generally meet the eye of the observer. The welt or top portion, for example, can be made quite plain and the pattern introduced lower down the leg. Similarly in making the foot the upper portion is the only part which in general requires to be covered with the pattern. There is an exception in the case of the French style of foot,



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Samples, prices and particulars upon request.

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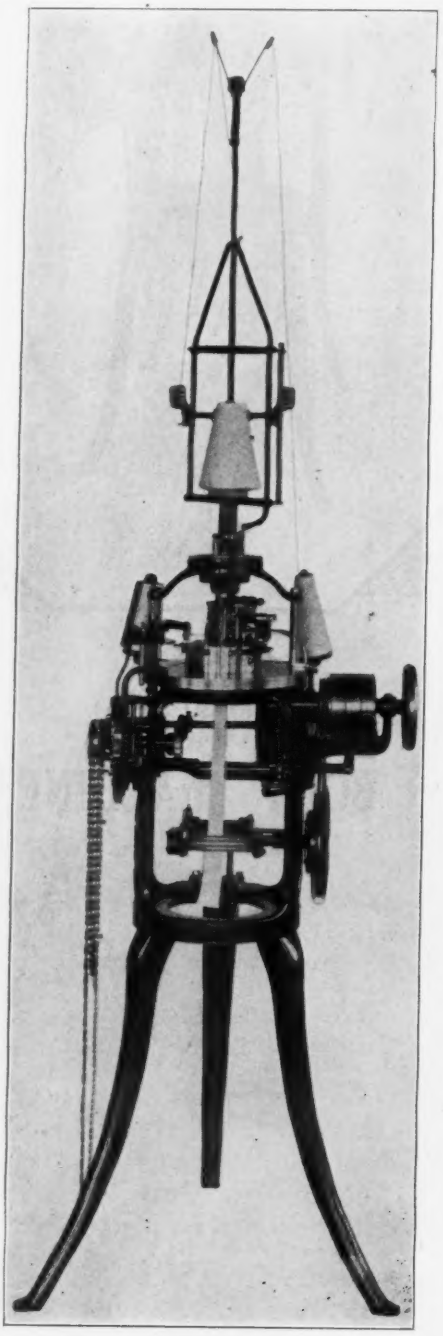

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largely in use in the continental countries of Europe. In this form the foot is made in a complete piece which is afterwards folded round the foot with a seam right along the center of the sole. Such articles must be made with the pattern extending the whole distance round for a rather curious reason. Such fancy hose are often donned at dancing and as low slippers are used, they often come partially off the foot and show the side and the foot sole to some extent. When this takes place with the pattern interrupted, as in the English or American style of foot, it causes a bad impression to be produced as compared with the result when the pattern is uninterrupted.

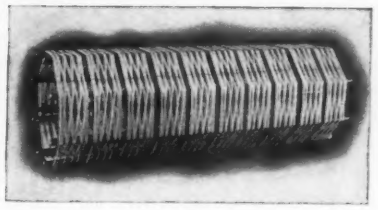
Figure 4 gives a view of a style of pattern which has been all the rage in many markets for some considerable time past, namely, the solid-colored diamond square or diamond on a white ground. The ground does not in general remain so for care is taken to make the fancy yarns of a different material than the ground so that in subsequent dyeing the white ground can be dyed and the fancy patterned portions will remain untouched. In the sample shown the check is worked in a cheap single cotton yarn and the ground is of white wool cashmere which will afterwards be dyed with a dyestuff which has an affinity for wool but none for cotton. In this pattern the diamond effect is made up from two colors, one gray and another heliotrope.

Among the Knitting Mills.

A group life insurance policy involving a total coverage of approximately $1,400,000 has been adopted by the mill and home office employees of the Real Silk Hosiery Mills, Inc., with headquarters in Indianapolis, Indiana, who have joined with the employing executives of that concern in accepting a plan offered by the Prudential Insurance Company of America. The policy is of the contributory type, with employer and employee sharing in the payment of premiums, and it provides for protection of varying amounts, graded according to length of service. It is in addition to the numerous benefits now granted to the workers through their affiliation with the Employees' Mutual Benefit Association, an organization previously founded for the welfare of the workers. To be eligible to the group insurance the worker must be a member of this mutual benefit society. He or she will be given protection of $1,000 and this will be increased at the rate of $250 a year until a maximum of $5,000 has been reached. New employees or those not at present members of the society will be eligible three months after joining it and will receive protection of $500, this being increased to $1,000 at the end of the first year and by $250 yearly until the $5,000 maximum is reached.

Purchase of the Model Mill, Spartanburg, S. C., owned by the Textile Industrial Institute, has been made by the Powell Knitting Co., of Philadelphia, which plans the immediate erection of 35 or 40 dwellings to accommodate 150 operatives. Ultimate plans of the company contemplate extensive production of a medium grade hosiery, it is announced.

The Rollins Hosiery Mills, Des Moines, Iowa, have let contract for improvement work which includes the re-building of the boiler plant, a 160 foot stack, a new 225-hp. horizontal return tubular boiler with Cokal hand stoker, and other miscellaneous changes. Lockwood, Greene & Company are the engineers.



Standard Reel used by the Industrial Fibre Co., showing the perfect diamond reeling of the Skeins, which assures good winding.

Important Features of

Industrial Fibre Silk

¶ The filaments of our Artificial Silk are flat and uniform—resulting in a high covering power.

¶ The twist is constant in each length of yarn.

¶ The yarn itself is soft and pliable, possessing a mild and uniform brilliance, withstanding bleaching and scouring treatments with soap and alkali, and is equally resistant to boiling, drying and ironing if handled properly.

¶ Industrial Fibre Silk withstands fully the action of acetic or formic acids.

¶ It winds easily—dyes evenly, not only within the same lot, but from batch to batch.

The INDUSTRIAL FIBRE Co.
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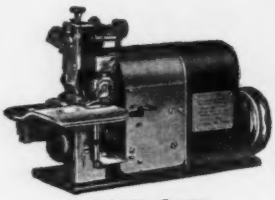

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IT MEANS: MAXIMUM PRODUCTION
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THE MERROW MACHINE COMPANY
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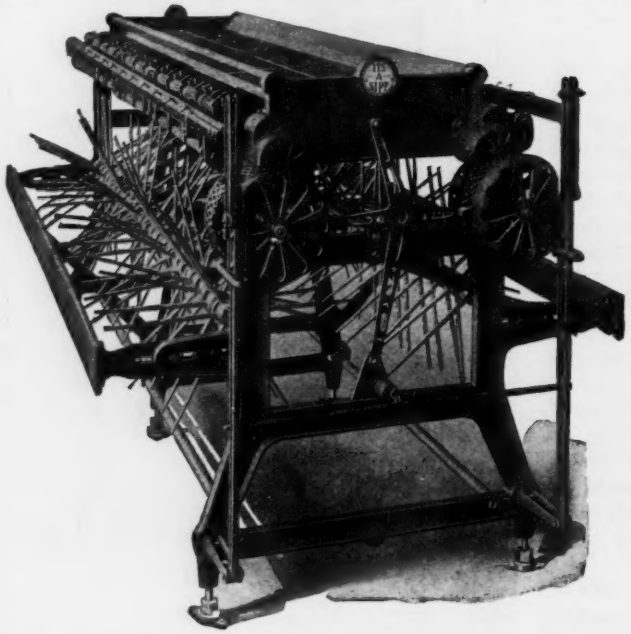
AN IDEAL WINDER FOR ARTIFICIAL SILK

ITS A TRADE MARK SIPP



THIS winder can be used for hard and soft silk and fine cotton yarns.
RIGID TRAVERSE MOTION. This is a radical departure from the usual traverse motion commonly used. Our patented construction insures uniform spools without frequent re-adjustment of traverse motion.
SPINDLES, are of the double drive type being driven from both ends which assures smooth running spindles which gives a better wound spool with ends built up with extreme accuracy.
METHOD OF SHIPMENT. Machines are shipped set up complete in sections, it being only necessary to couple sections together when received.
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Quillers Reels Raschel Warpers and other silk machinery.
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THE SIPP MACHINE CO., PATERSON, N. J.

Crescent Knitting Co., Statesville, N. C., has been incorporated by J. C. Fowler, J. H. Davis, E. B. Watts and others, of Statesville.

An investment of approximately $500,000 will be made by the Davenport Hosiery Mills, Chattanooga, Tenn., in the construction of an additional plant on East Eleventh St., to be known as Davenport Hosiery Mills No. 2. The building will be of reinforced concrete, two stories in height, of modern daylight construction. Lockwood, Greene & Company are the engineers.

W. B. Davis & Sons, Fort Payne, Ala., plan for an additional story to be constructed at their plant, to cost approximately $18,000 exclusive of the machinery to be installed.

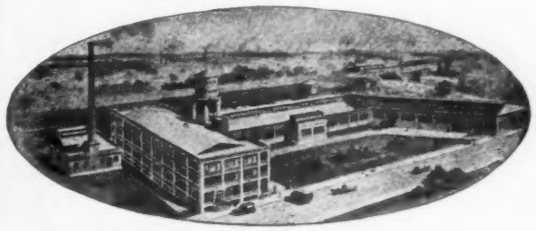
Date of Market Openings Uncertain.

The infants' socks lines of a number of mills were, or will be, opened this month for the season of 1925-26, to the dissatisfaction of a number of leading manufacturers. In fact, it is stated that samples of one mill were shown to a few western jobbers in the latter part of May.

In the opinion of several of the more important manufacturers, the showing of samples and naming of prices before July would be premature. A manufacturer whose view is concurred in by some others says: "Every year for four years mills have opened their lines early and waited from six to eight weeks for orders. During this period of waiting, price competition was indulged in, and when buyers felt they had forced manufacturers to the bottom they began placing orders. I think that the performance of past years will be repeated this year if lines are shown before jobbers are ready to operate. Most all of the mills will be shipping out goods during June for the current season, and it seems to me the height of folly to expect jobbers, while their present orders have not been completed, to do any buying for next year. Besides, everybody knows the cotton market became irregular last month, and I question whether many manufacturers would want to contract for yarns until cotton prices become more stable. I do know that instability in yarns would be one excuse of jobbers for not operating in hosiery for deliveries six months hence."

Infants' socks for the next season will run toward finer gauge, and a number of new patterns were made up last month. It is the general opinion that jobbers will not do much buying until they have seen the patterns and heard the prices of all mills. "We would prefer to open in August," said one manufacturer, "but will come on the market so soon as our competitors do."

Benjamin Eastwood, Jr., secretary and sales manager of the Benjamin Eastwood Company, Paterson, N. J., attended the annual imperial session of the Mystic Shrine at Los Angeles, joining the pilgrimage with other members of the Divan and nobles of Salaam Temple, A.A.O.N.M.S., he being a member of Salaam Temple Divan. The party left Newark on May 25th and will return on June 24th. While in Los Angeles, Mr. Eastwood plans to visit the broad silk manufacturing plant of the Golden State Silk Mills, which is equipped with Eastwood auxiliary machinery and the Eastwood spring pick loom.



View of our Mercerizing and Bleaching Plant

BOGER & CRAWFORD

Established 1908

Spinners, Bleachers, Dyers and Mercerizers of High Grade Combed Yarns

By using our Spinning and Mercerizing you are always assured of a standard product.

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Main Office, Factory and Warehouse
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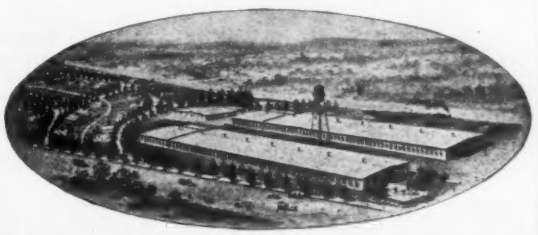

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TRYON, NORTH CAROLINA

Our Specialty—

SINGLE Mercerized

Yarn for Splicing

and Plaiting

Single Mercerized Yarns up to 100/1—Also Two Ply Mercerized 100 to 140

Wire or write us for prices and samples

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TRYON, NORTH CAROLINA

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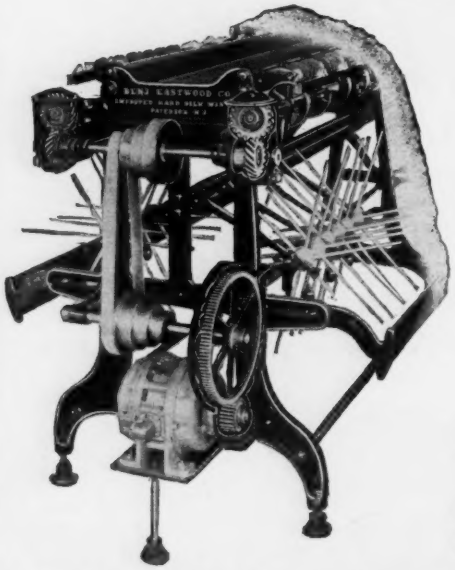

hard, even bobbins
more production
spiral, machine cut gears instead of noisy, bevel gears
saves floor space
swifts keep their shape
pipe construction
in any number of spindles
for hard, soft, artificial silks or other fine counts of yarn
shipped in sections, if desired.

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LOOMS—WINDERS—WARPERS—QUILLING and COPPING MACHINERY—SPECIAL and TRANSMISSION MACHINERY

BENJAMIN EASTWOOD COMPANY, PATERSON, N. J.

We invite our readers to make use of this department for the discussion of any and all problems arising in connection with the knitting mill from the office to the packing and shipping departments. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. All questions will be answered as promptly as possible. The names and addresses of the contributors must be given, but will be held in confidence and a pen name substituted when printed. All accepted contributions other than questions will be paid for after publication. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Another Problem on Ribbers.

EDITOR COTTON:

We have been having considerable trouble with loose courses on Wildman and Brinton ribbers. When we get the slack course large enough for the operator to set the top quickly, we are troubled with cuts and the needles dropping stitches. Our machines are: 300-needle, 4¼-inch diameter; cylinder, 150 needles, 36 gauge; dial, 150 needles, 48 gauge. We are using a single 18s combed yarn to make misses' plain and derby ribbed hose.

I would appreciate any information any of the readers of "Knitting Kinks" might offer.

CONTRIBUTOR NO. 752.

The Importance of Tension Location.

EDITOR COTTON:

You have had quite a bit of discussion in "Knitting Kinks" on plaiting, and the causes of mis-plaiting, etc., and most everybody seems agreed that the main thing is to get the right kind of a tension device for the work being run.

But have these men considered the importance of the *location* of the tension? I think this has everything to do with it, and I have found that the best place to put the tension through which the body yarn passes is as near as possible to the knitting point, or needles. If the tension is put on at the top of the yarn stand, where I have seen lots of them, then when a little hang occurs on the cone—as hangs will sometimes—it gives the yarn some slack which affects the even flow of the yarn from the tension to the needles. I would recommend that these men try this. I had some barrel tensions that came on my machines for the body yarn, or the yarn that goes on the outside. I couldn't put these down close to the needles because there wasn't room, so I changed these over to the other yarn, and secured some disc tensions for the body yarn which I put right down as close to the needles as I could get them.

In "Knitting Kinks" some months ago "Old Knitter" recommended setting the needle on a looper—a Wright steady dial looper—as low as possible in order to prevent skipped stitches. I don't know so much about that, because: this is a crooked needle, and it should just barely touch the point upon entering. If you get it too low it has a tendency to raise the point on the needle before it gets to the stitch, and it will go over the stitch instead of under it, causing a drop stitch, or it will cut the hook thread.

One of your readers has asked what will cause menders in the gore of the heel and toe. Well, among other things, this will be caused by having too tight a tension on the yarn that goes into the heel and toe, or a bad adjustment of stitch or sinker cams also will cause it.

C. L. W. (TENN.)

Do Men or Women Make the Best Knitters?

EDITOR COTTON:

While the following subject is not exactly technical, I am sure some opinions and experiences on it would be of interest—especially to mill managers and superintendents, and I should like to see it discussed in "Knitting Kinks."

It is as to whether it is best to have girl or boy operators for the knitting machines. I, of course, understand that it depends a good deal on local conditions, etc. However, we are about an average mill, in an average locality, and our system differs from most of the other mills I am familiar with, in that we use men knitters, with girls to do their topping for them. On 204- and 220-needle work our men knitters run eight machines each, while a girl furnishes tops for four machines, making two girl toppers for each man knitter.

Our theory is this: If we use a girl knitter who does her own topping, she doesn't have time to look over her work while the machine is running out. With a man knitter having his tops ready for placing in the machine, we figure he has much more time to give his product a sort of preliminary inspection, and we find this works out satisfactorily from many standpoints.

Furthermore, I don't believe I ever saw a girl fixer in my life. They always are knitters—so far as the knitting room is concerned—until they marry one of the fixers, or something else happens. By having male operators on the machines, who have time to inspect not only the product but the machines as well, and by giving them a little encouragement every now and then, we have developed some mighty good fixers right from the machines. I noticed an article

on "fixing" and "who makes the best fixers" in a recent issue of COTTON, and want to write you a letter about that, sometime, too.

As stated, I should be glad to see the opinions of other superintendents on this question. What's sauce for the goose may not always be sauce for the gander in the knitting game, maybe we can't, and don't want to, adopt the other fellow's plan as a whole, but still we would like to have his viewpoint, especially if it disagrees with our own.

K. L. J. (GA.)

Hints on Inspection and Yarn Tension.

EDITOR COTTON:

Making ladies' fine silk work requires a man to be on the lookout always for small defects. With even the most rigid system of inspection, and most carefully trained and experienced inspectors, complaints often come back from the customer because of defects.

In addition to the regular system of inspection, I now have the forelady in the inspection department take five dozen stockings that have been passed by each inspector, and go over them herself, and furnish me with a report of the defects she finds which the girls pass up, as she does not examine the goods until the girls have already inspected them.

By doing this I note every girl almost will let some things slide through—that's nothing but human—but the biggest thing gained from this "kink" is the psychological effect upon the girls. when they know someone is "checking up" on them, they are going to look just a little bit closer.

We make a ladies' stocking with mercerized top and with the leg composed of 120 Denier artificial silk and three-strand pure silk. The pure silk being plaited on top of the artificial silk. This, as you know, makes a difficult piece of goods to knit. You have had some discussion on tensions for plaited work. We find our best results come from using two tensions on the pure silk on this work—one, a disc tension, located as close as possible to the needles, and the other the compensating type, placed up on the yarn stand. The compensating tension, for this work, is not satisfactory, alone, but the combination of the two gives good results.

Also we use a disc tension on the artificial silk on this number—not too much tension, but just a little—as we found if this yarn was allowed to go in free, the stocking would have a sort of fuzzy appearance caused by the artificial silk sticking out from the fabric a little bit.

P. E. P. (N. C.)

To Prevent Latches from Sticking.

EDITOR COTTON:

I note the question of "D. M. T." in "Knitting Kinks" for March, with reference to latches sticking on George D. Mayo machines and causing drop stitches in the transfer work. I suggest that if "D. M. T." will give each knitter a small brush and have them brush the latches down every morning after oiling, I don't think he will have any more of this trouble.

I hope this will help "D. M. T.," and am sure it will if he will try it.

V. T. (TENN.)

Old Sol is smiling

because he has cunningly
hid his powers in
Solozone, through which
for 15 years
he has produced his own
harmless bleaching effect
on Cotton, Wool, Silk

-Ask us-

THE ROESSLER & HASSLACHER
CHEMICAL CO.
709 Sixth Ave. New York.

Some Useful Hosiery Forms.

EDITOR COTTON:

In going around to visit other mills and mill men, I have found that some men keep records of the styles of hosiery they make, and some do not. Also I have observed a number of ways the men have of doing this, some endeavoring to carry it in their head, others using typewritten data in notebook form, and others having regular forms for the purpose.

I use a form which has been devised for this, and inasmuch as it adequately meets all of our requirements, and

STYLE NO.
SAMPLE NO.
SIZE 9
DATE

HOSIERY COMPOSITION AND YARN COST RECORD

DESCRIPTION: Pure Silk, ladies

Machines Scott + Williams – K

Rib Cylinder Diam. Knitter Cylinder Diam. 240 - 3½

Rib Cylinder Needle—No. Ga. Knitter Cylinder Needle—No. 90 Ga. 54

Rib Dial Needle—No Ga. Production per Mach. 2½ Doz. – 10 hours

PARTS	CHAIN	YARN DESCRIPTION	Weight	Price	Cost
Inside Welt	14	20s/1 combed peeler	2 75		
Outside Welt	17	50s/2 Mercerized	6 5		
Elastic Band Knee	8				
Rib Top					
Leg to F M	19				
F Marks	14	12 Strand	10.0		
F M to D Sole	7				
Double Sole	6	80s/1 Mercerized	1 0		
Foot	14				
Heel and Toe	9-9	2 ends 80s/2 Mercerized	3.0		
Ring Toe	1				
Mock Seam	yes	40s/3 Mercerized	.21		
~~Sewed Seam~~					
Total					

Remarks:

FIG. 1

with the thought possibly of offering a suggestion of value to the man who does not make use of a form of this kind, I am sending you with this letter a sample of one of these, which we call our "Hosiery Composition and Yarn Cost Record," shown in Figure 1.

The superintendent or manager recognizes the value of such a record. Once a stocking is made up, regardless of how many or how few were made, or how long afterward we desire the information, we can go to this record and find out everything necessary to know about it. The accompanying form is filled out in illustration of how it is used, and the various items are self-explanatory to the mill man. All information relative to the machine is given, with approximate production, number and gauge of needle used, etc. The second vertical column shows the number of links in the pattern chain used for each of the parts shown in the first. The next column refers to the yarn, and shows the kind and number of yarn used in each instance, with the weight in ounces, the price of the yarn and the cost of the yarn.

On the back of this form, which is not shown, we have a number of blank spaces which are used for recording the weight record of a dozen stockings from each of ten machines in making up the stocking. We show the total weight of yarn used, the actual weight of one dozen, the looper clips, double sole clips, the weight of the undyed stockings and the finished weight. The cost is then figured from this average, and transferred to the front of the record, therefore, the average weight of these ten dozen stockings becomes an accurate cost record. These forms are made with holes in the margin for loose-leaf filing.

Another useful form is shown at Figure 2, and is called the "Fixer's Report." It will be noted a place is shown for the name of the fixer, and the names or numbers of his knitters, together with their respective number of dozens knit, their seconds, their number of what we call "passed seconds," and their thirds, and the amount of waste in ounces, together with the number of dozens inspected and the number of menders found. The percentage of menders, and seconds and thirds, together with the number of needles used by the fixer's section, can be shown if desired.

The advantage I see in this report is that it gives the fixer an accurate record of what his set of machines is doing, in production, seconds, thirds, waste and menders. It also shows him, in the column "Passed Seconds," just which are his good knitters and which are his bad knitters, as this "Passed Seconds" column represents the seconds which the knitters do not find during their inspection and which are found by the inspectors and reported against the knitters. This record will allow the fixer to keep in behind his bad knitters and prevent them from allowing seconds to get through. He is particularly interested in this "Passed Seconds" column because passed seconds represent bad work coming off his section which the knitter has not showed him, therefore, he has not had a chance to fix the machine making these passed seconds.

As the knitters take the work from the machines, they separate them according to firsts, seconds, mis-seams and waste. This is made convenient by having a piece of wire bent so as to hold each kind. The number of seconds, mis-seams, and waste, made by each machine is recorded on the form shown in Figure 3. This report, made to cover a two-weeks' period, and with sufficient lines to show the number of machines that may be handled by each operator, is for

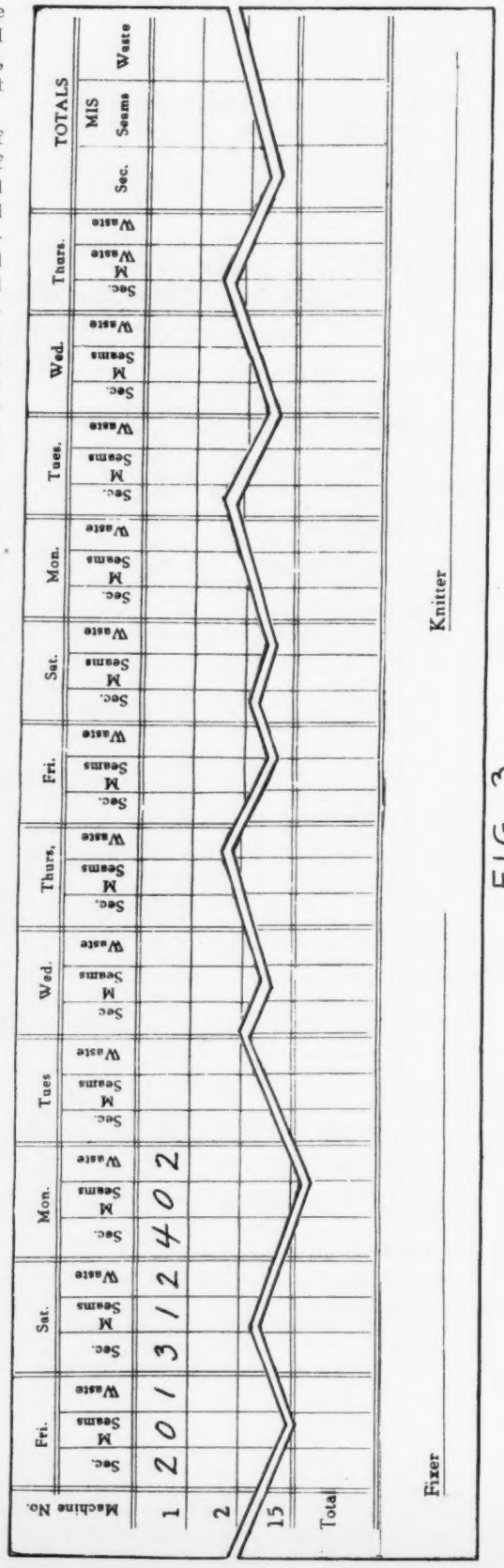


FIG. 3

Date March 30 1925

Louis Edwards Fixer

KNITTERS	Dozens	Seconds	P. Seconds	Thirds	Waste	DOZENS	
						Insp.	Menders
A.K. Nitta	100	30	20	40	25 oz.	100	90

Needles Used

Mender % 3%

Sec. & Thd. % 3%

FIG. 2

the information of the boss knitter, so that he may look over the record and at any time determine which machines in each section are producing bad work, and, if he desires so to do, he can go to these machines, find out exactly what the trouble is, and bring the seconds, mis-seams and waste down to a minimum. F. D. S. (N. C.)

A Remedy for Cut Seams.

EDITOR COTTON:

A bunch of us fellows were talking the other day about your discussion section on knitting, and somebody said something about how strange it is that we can work at a thing for years and think we know it "by heart," so to speak, and then run across a simple something that makes us wonder why we didn't think of it years ago.

"That reminds me of something I found out the other day," spoke up one of the old-timers who has been in the mill business all his life. "It convinced me that any man who thinks he 'knows it all' about a knitting mill is fooling himself. We can all learn every day.

"Now, as you fellows know, I've been running seamers on ladies' work for over seventeen years, and I naturally thought if there was anything that I did know, it was seamers. We have always been having more or less trouble with cut seams on this work, and I had always said they were caused by something else.

"But one day last week, we got to dickering around and found that the presser foot had so much friction on it, and was pressing down so hard on the stocking on the needle plate at the throat, that it was causing a crease that made this cut seam. By taking off some of this pressure, we found that most of our creases and cut seams disappeared."

I didn't say anything then, but I was having that same trouble, and when I got to the mill the next morning I took a look at my seamers. And sure enough, that was the trouble! I eased up on the tension spring and could see better results right away.

I have a different make of seamer from that the old-timer uses, and as his remedy worked on it all right, I believe it will do it on any other make.

If any of your readers are bothered with cut seams, I make this suggestion for their benefit. Of course there's a limit to all things, and if too little tension is put on the presser foot, the goods won't stay under it. But by experimenting it can be adjusted just right, and I'd be almost willing to bet the bonus I hope to make this year by cutting down my seconds that more men are pressing the goods tighter than they think or that there is any need for.

A. R. (GA.)

The Magnifying Glass a Useful Tool.

EDITOR COTTON:

Before I got into the knitting mill end of the business, I was with a cotton mill, and while there of course found many uses for what is known as a pick-glass, or linen-tester—a small magnifying glass on a folding stand. When I came over to the knitting mill, I brought this glass with me, and find it a very handy article to have in my desk.

For example, if there is any bad work coming through, I can examine the needles under this glass to see if they are causing it. Sometimes this magnifying glass will show up places on the needles not visible to the naked eye.

Also this glass will immediately show up bad needle rivets if we find any trouble that seems to be caused from that source.

On the finished work itself, the glass has proven useful for the examination of our silk hosiery for needle streaks, etc. You would be surprised at how the glass brings these out. W. E. R. (GA.)

Overcoming Drop Stitches in the Instep on Model R I Machines.

EDITOR COTTON:

Any knitting manufacturer who uses Model R I machines is familiar with drop stitches on the instep of the stocking. As the machine transfers into the heel, the needle dial raises with the loops still on the dial needles on the instep side. Due to the reciprocating motion of the machine while on the heel, these loops are stretched.

As the machine transfers off the heel, the dial lowers back to its normal position, and due to the fact that the loops were stretched, the loops have a tendency to roll off the hook of the hook needle, causing a drop stitch.

This trouble is generally fixed by taking the play out of the bevel pinions just above the dial, with the washers provided for this purpose; also by applying a cam on the dial raising cam to let the dial lower more gradually while transferring off the heel.

I overcame this trouble by lowering the needle dial slightly, about 1/16th of an inch, by the adjustment of the top of the dial raising rod. For the amount that I lowered the dial by this adjustment, I took up by raising the dial raising cam plate. I did not change the adjustment for the dial on the set-screw, just above the dial, as this would get the needle cylinder out of relation to the dial. Care must be taken also not to get the dial too low while on the heel because the saw-tooth sinkers will cut into the fabric on the instep side of the foot, causing pulled stitches and cut-outs on the instep.

The merit of this adjustment is that it shortens the loop on the dial needle while on the heel, making less chance of its rolling off the hook of the hook needle than was the case with the longer loop, when the dial lowers. Making the suggested adjustments properly should practically do away with drop stitches on the instep. RYMI.

Checking Up on Underwear Defects.

EDITOR COTTON:

I think it a good idea for the knitting mill men to discuss methods and problems. I was interested in reading the letters from the underwear men on the systems for checking up on defects, as published in "Knitting Kinks."

I doubt whether any standard could be laid down for this work, as conditions vary so much. However, the biggest help I have found is to keep the cutting room foreman and the knitting room foreman in close touch and cooperation on this point. We have our knitters stop their machines once an hour and pull out the work and look over it. Further than this we have no special system in the knitting room. The work is taken off, weighed, delivered to the bleaching department, which receives credit for it when it is delivered to the cutting room. The cutters are supposed to inspect the goods, but as it is a piece-work proposition with them, their inspection cannot be taken as final, so we have an additional independent inspector after the cutting, who catches quite a number of things the cutter overlooks in his haste.

While we might have ten machines in the knitting room on the same class of work and on the same size, we find that it usually is divided between not over two operators and then when defects develop, we can trace back to the proper party. Our mill is a small one. and we do not put the knitter's number on the goods, although in a larger plant this could be done. F. S. T. (N. C.)

Criticizes "P. J. (Ga.)" and Gives Another Suggestion for Saving Silk in Seaming.

EDITOR COTTON:

It seems to me that the fellow who wrote the article that appeared in the December, 1924, issue of "Knitting Kinks," and signed "P. J. (Ga.)," should not go unanswered. In his article he states that he discovered a way to save sixteen dollars a day in seaming ladies' silk hose on the Merrow machine, "by using a silk yarn in the needle, and a mercerized yarn in the hook." It seems to me a more appropriate title would have been, "We Discovered We Have Been Wasting Thirty-Two Dollars a Day."

This man should have known better than to have backed his seams with silk. Had he been working for our concern he would have been reprimanded for his blunder.

He should also know that silk and mercerized thread take the same dye, and should thread his Merrow machine with mercerized thread in both needle and looper; thus an additional sixteen dollars a day will be saved.

Y. T. (MICH.)

Knitting Machine Fixers.

EDITOR COTTON:

The letter on "Fixing Knitting Machines," which was published a month or so ago, was certainly a good one for the fixers; and it would be a good thing if a lot of superintendents and mill managers would have it typewritten and distribute the copies among the fixers.

In my experience as a fixer I have seen many a so-called fixer pull the wool over the eyes of the big boss, and get by with it. If the boss would only use his brain in hiring a fixer he would get better results in production, for there are a lot of so-called fixers who have a lot of "hot air" and that's all.

It takes years of hard work to make a good fixer. Fixers can all learn if they will use their brains, and buckle down to it and cut out the hot air about being better than the other fellow. If a man is better than the other fellow, he should give him a helping hand, for this life is short and all have much to do. Why not sow the seeds of good deeds so that when life comes to an end the work will still go on?

The mill shouldn't be too hard on the fixer, for some of them have a hard road, and the manager should remember that every time he adds something new to a knitting machine it means a lot more trouble for the men who have them in charge.

Some good fixers don't know how to handle the help; a fixer should be a leader of the help, and should always use kind words. I have seen good men in the game whom the employer didn't know how to handle. He would just keep giving him more work and then wonder why he didn't get out more production. I don't care how good a fixer is, if he has too much work to look after he will not get out the production. It takes only one bad machine to tie a man up for a whole day.

Fixers, in working on machines, should remember to not let them get on their nerves. And they should be self-

starters and not wait for the boss. Roll up their sleeves and dig right in! The time spent in waiting is all lost.

J. D. D. (PA.)

Needle Breakage and Production.

EDITOR COTTON:

In reply to "B. S. C. (N. C.)" on his question relative to breakage of needles on Scott & Williams machines and production, I have the following information to offer:

Needle breakage, also jack and sinker breakage, depend entirely upon the mechanical condition and speed of the machines. The first consideration is the speed at which the machines are now running. Scott & Williams, Model K, 3½-inch, 240-needle machines should not be run more than 230 revolutions per minute for good results, regardless of whether the machines are running on rayon, silk, cotton or lisle.

One day's production of eight hours on 16 machines, of Scott & Williams' machines, should amount to an average of 40 dozen per day on artificial silk, or rayon, as it is now being termed by some.

The needle breakage should not amount to more than 20 needles per day. This production is based on 150 chain links per machine.

It must be taken into consideration that if the machine is not in good mechanical condition, such as breakage on the set ups, or on the heels and toes, the total will run up considerably, say to 50 or 60 needles per day .

Breakage of transfer jacks should be very few, if any at all. If the jack dial is lined up with the needle cylinder so that the transfer bits when coming out, go directly over the needle which is drawn down out of action, very little trouble should be had.

Taking an average of 16 machines for one day's run, of eight hours, 10 transfer bits is a fair estimate. When a transfer dial is not meshed properly when starting the machine, this naturally would bring this figure up considerably. In starting out new operators, this is a common occurrence, the machine sometimes breaking all the transfer bits in one smash up.

Breakage of sinkers should be very few. This breakage is mainly due to pile-ups. 16 machines for one day's run of 8 hours, should not amount to more than five or ten sinkers.

The figures given, it must be taken into consideration, are under good working conditions and for machines that are in good mechanical condition.

If the inquirer desires information as to how to stop this breakage, the writer would be glad to offer some help.

RYMI.

EDITOR COTTON:

Responding to the inquiry regarding the amount of needle breakage, how many dozens are secured to the needle, etc., I can give you our figures for the past four months on a monthly basis. Last month, turning out a production of 8,201 dozens, we used 1,923 needles; the previous month we used 1,837 needles to make 8,520 dozens; the month before that, we used 2,112 needles to turn out 9,996 dozens; and during the month preceding that we produced 7,478 dozens, using 1,380 needles.

We make 200- and 220-needle ladies' work. The needles referred to are 48 gauge.

I know these figures are correct, for I took them from our books. We had a standing order for 2,500 needles a month, and have just asked the needle manufacturers to hold off a while as we have a surplus on hand.

MANAGER (N. C.)

Loop Skipping and Other Difficulties.

EDITOR COTTON:

One of your readers recently brought up the subject of a Record looper skipping. I run these machines, also, and here are some of my observations on this difficulty:

Drop the needle whichever way the loop seems to be falling. A whole lot of times when a loop is falling that way, it is in the yarn, as the twist in the yarn can cause that.

By moving the hook to catch the loop right quickly, you can move the hook and make it catch the loop on the inside, but if you do that, you lose it on the outside. You cannot have the hook come in contact with the loop too quickly because it must make its contact with the needle on the inside as well as with the loop on the outside.

While I am writing I will tell of a difficulty we had on a Standard machine recently. Every now and then, the machine, just as it went onto straight-away circular knitting after making the heel or toe, would break 25 or 50 latches. We worried with it for some time and then found that a rough place in the carrier was causing it. When this was dressed off, the trouble stopped. L. R. (S. C.)

An Opinion on Three Questions.

EDITOR COTTON:

I notice in a recent issue of "Knitting Kinks" that one of your contributors is having trouble with long loops made by the mock seaming attachment on a Scott & Williams machine. I find quite a number of plants troubled with this same problem.

My suggestion is that the bits, or transfer jacks, be kept in good shape. If they get bent the least bit they will hang the seaming yarn and cause it to throw off the loops.

Another man said he has difficulty with his George D. Mayo machines after oiling in the morning, saying the latches stick. In this connection I would say he might be using long latch needles. which would contribute to his trouble. I prefer short latch needles, because they do not have the tendency to cling, so to speak, to the needle and will open up better. Perhaps he is using a needle that has too wide a cheek and too wide a hook. Maybe the hook is too large for the latch.

Still another man reported trouble from needle butts being broken off in the heel. If the pick stands are set at the wrong angle as regards the needles, this trouble will result, and pick cams set too high or too low will cause it.

H. A. S. (N. C.)

R. G. Haskins Co., 516 West Monroe St., Chicago, Ill., have issued Catalog 38 descriptive of their line of flexible shaft equipments, portable tools and labor saving devices.

The Yarn Market

Conditions in the textile industry as a whole for the first five months of 1925, including May, have been most serious from the standpoint of manufacturers, many declaring it the most difficult period for years.

That portion of the industry represented by the Philadelphia yarn market has borne its quota of the burdens inflicted by uncertain cotton, disinterested prospective customers, and production in the face of no profit. It also has had some problems of its own peculiar to the trade.

The past month in the yarn market, as reported here, offers nothing new in the way of information or developments to record. There has been a protraction of the dull and inactive condition that has existed for months, and the passing of another month has presented few new indications of a revival to a more healthy situation.

During the period in consideration, offered prices for yarn continued to drop, with a result that the time of this writing finds rates generally at the lowest level of this year, following a rather even decline from the rates of January, after a temporary flurry some two months ago. This condition prevails for the entire list of counts handled, practically speaking. Some numbers are off more, proportionately, than others—but in general everything is off; that is, in quotations at which the larger amount of business is transacted, according to observations.

Spinners, with the unified action of an association involving a large percentage of the mills, have seemed to stand more or less firm in their position, and variously are not interested in such business as is offered or uncovered at rates which they present figures to show are considerably below cost of production, to say nothing of profit. So far as is known there is no concerted action toward curtailment of production, though individual cases may be sighted where reduction in operating time has been enforced to more nearly approximate demand with production. It is the spinners' point that the rates quoted, which they point out are below cost to them, have been brought to their present levels by the influence of cotton fluctuations and other factors; that they are holding firm for at least breaking even. It is also their point that a very small amount of goods is to be found in stock, while it is also the belief of the association of spinners that the solution and remedy for the situation lies in a general policy of curtailment on the part of the mills.

The consuming end of the market continues to show a more or less independent stand on purchasing, limiting their orders for the most part to hand-to-mouth transactions, which, as has been commented upon, seem to continue to prevail as the buying policy for some time to come.

In this market factors express the belief that stabilization of the situation is hardly in sight, barring any unforeseen occurrences in cotton and cloth conditions. They point to the absence of speculation and its influences from this market throughout the year so far, indicating their belief that the present situation is the result of natural causes. Opinions vary considerably as to the possible amounts of carded and combed yarns in stock at the mills.

For the most part, carded yarns seem to be suffering more than those in the combed sections of the list, the reductions in price coming more frequent and resulting in greater declines, comparatively. Opinion is expressed in the market that the mill stocks of these yarns would, upon investigation, be found larger than those of the combed variety.

Following are quotations on the Philadelphia market on May 18:

Single Skeins.

4s to 8s	.36	10s	.36
12s	.36½	14s	.37
16s	.37½	20s	.38
24s	.41	26s	.41½
30s	.43		

Single Warps.

8s	.36	10s	.36½
12s	.37	14s	.37½
16s	.38	20s	.38½
26s	.42	30s	.43½
40s	.55		

Frame Spun Carded Yarn on Cones.

8s	.36	10s	.36
12s	.36½	14s	.37
16s	.37½	18s	.38
20s	.38	22s	.38½
24s	.40	26s	.41
30s	.42	40s	.53
30s double carded			45
30s tying-in			41½

Two-Ply Skeins.

8s	.36	10s	.36½
12s	.37	14s	.37½
16s	.38	20s	.38½
24s	.42	26s	.43
30s	.42½	40s	.54

Two-Ply Warps.

8s	.36½	10s	.37
12s	.37½	14s	.38
16s	.38½	20s	.39
24s	.42½	26s	.43½
30s	.44	40s	.55

Carpet and Upholstery Yarn in Skeins.

8s and 9s 3-4 slack	38
8s 3-4 hard white warp twist	35
8s and 9s 3-4 tinged tube	34
8s 3-4 hard twist waste	33

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	.50	20s	.55
24s	.58	30s	.62
40s	.73	50s	.80
60s	.85	70s	.95
80s	1.12½		

Single Combed Peeler Yarn on Cones.

18s	.48	24s	.53
30s	.61	36s	.65
38s	.66	40s	.68

Mule Spun Carded Yarn on Cones.

10s	.42	12s	.43
14s	.44	16s	.45
18s	.46	20s	.48
24s	.49	26s	.50
30s	.51	40s	.59

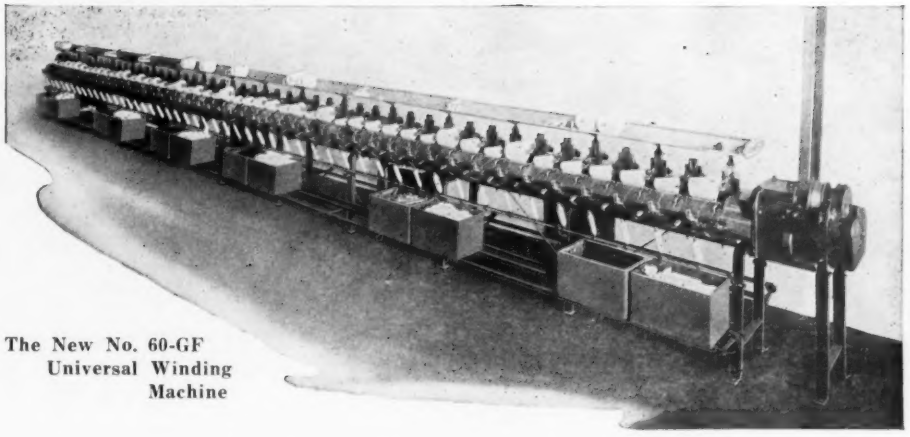
Mule Spun Carded Yarn on Cones

10s	.50	12s	.51
14s	.52	16s	.53
18s	.54	20s	.55
22s	.56	26s	.60
28s	.61	30s	.62
36s	.64	38s	.67
40s	.70		

The Industrial Works, Bay City, Michigan, manufacturers of locomotive cranes and crane equipment, announce the opening of two new district offices, one at 425 Whitney Central Building, New Orleans, in charge of John A. Abele, and the other at 843 Hurt Building, Atlanta, in charge of John J. Murphy.

The Cleveland type collar oiling bearing is described in a bulletin issued recently by the Hill Clutch Machine & Foundry Co. This bearing is supplied in all styles of rigid and ball and socket mountings. The positive oil feed and distributing system immediately start a forced oil circulation, it is pointed out, and an unbroken oil film is maintained which lifts the shaft free from all metal contact, giving a film-borne bearing.

Bulletin T-221 of this company, just issued, describes their industrial type of spur gear speed transformer.



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The Knit Goods Market

The second quarter of the year, thus far comparatively brisk in hosiery, promises to finish very satisfactorily to manufacturers. There is a somewhat lazy situation in cotton underwear, and sweaters have been by no means active. The hosiery primary markets may be described as maintaining a slow but steady pace, while in mills there is about the same measure of activity as in the months preceding Easter. In all respects hosiery is in a far better position than at this time a year ago and the outlook, as gauged by leading factors, is for a fairly brisk year. Production has been increased, along with shipments, orders booked and unfilled orders.

While statistics for March might be viewed as stale reading in June, they are interesting in their showing of a very material improvement. Comparing with the corresponding month of 1924, there was a gain in production of all classes as a whole. Cotton hosiery for men fell off considerably, but gained slightly in women's lines. The term cotton, of course, embraces mercerized.

The larger gains were scored by women's full-fashioned silk and seamless rayon. It seems that in silk mixture women's hosiery did not move so well, while gaining in half hose, which also was produced in considerably larger quantity in all-rayon.

The gains and losses of course cannot be construed as pointing to a continued improvement, as it has happened on more than one occasion that heavy production eventually led to an over supply and demoralized markets. In this instance, however, there is nothing to indicate any decline in demand. Significant in the statistics for March is the showing of an enormous increase in unfilled orders. Another satisfactory exhibit is that relating to finished products, of which there was less in mills on the first of April than at the corresponding period of last year.

The statistics referred to are from a report of the Department of Commerce, and as 327 establishments who supplied the information produced 65 per cent of the total value of hosiery reported at the census of manufacturers in 1923, it may be said they are as nearly trustworthy and accurate as can be had.

Price stability, obviously, has had a great deal to do with the tranquility of the hosiery market. Going back to June, 1924, it is found that the quotations on cotton goods have undergone only fractional changes and that fluctuations in most other lines have been insignificant. This may be attributed in great measure to comparative steadiness in the raw cotton and silk markets, which last month showed no important change since the beginning of the year.

While jobbers as a class continue to buy very conservatively, to the disadvantage of themselves and manufacturers, more forward business in silk hosiery is being placed than during the first half of 1924. Aside from the larger hosiery specialty jobbers, there are, according to manufacturers, only a comparatively few distributing houses that buy hosiery in large quantities for distant deliveries. But the disadvantage to manufacturers by reason of piecemeal buying for jobbers is in large measure offset by the increased business that is coming from chain stores and mail order houses, to say nothing of demand upon mills from concerns selling direct to consumers by the house to house method but not engaged as manufacturers.

A direct-to-consumer concern was in the market last month for one thousand dozens of women's spring needle silk hosiery. Several mills to which the business was offered had to decline it for the deliveries specified, and also declined some export business.

Spring needle manufacturers appear to be as busily engaged as the mills employing full-fashioned machines, and some in Philadelphia are working nights. Jobbers objected to mill prices, contending they could not pay $8.00 a dozen for 10 strand 18-20-inch boot stockings, some insisting they must buy at $6.50. This latter figure of course is ridiculed by manufacturers. Several, however, are selling for large accounts at $7.50, but some mills seem to have no difficulty in getting $8. One mill specializing in spring needle silk is selling 9 strand 18-20-inch boot at $7.50 and has all the business it can accommodate. The larger buyers of spring needle hosiery are, according to various reports, catalogue houses and chain stores. Jobbers who regard spring needle hosiery as in an awkward price range are heavy buyers of latch needle goods, and some few mills are operating to capacity. One in particular, making 10, 11 and 12 strand hosiery, has two shifts of operatives and is barely able to keep production abreast of shipments.

Artificial silk hosiery, in the better grades, for women, seems to be in almost as great demand as natural silk seamless. The cheaper goods appear to be not going into distribution so freely. A few mills specializing in artificial silk of the better type are well supplied with business. One of these representative establishments, using 200 denier yarn, knits about the equivalent of a 14-strand silk stocking. This mill is sold well ahead and, although operating every machine full time single shift, has been declining considerable business. This particular manufacturer experimented for quite awhile before satisfying himself that the type of construction upon which he finally determined was such an improvement over the general run that he could feel assured of a steady volume of business over a protracted period. While some retailers get one dollar a pair for the stocking, in some stores it is seen priced 79 cents, special.

Women apparently are standing by staples in silk and rayon hosiery and novelties. But while these are shown in considerable variety, they do not appear to be causing much of a hubbub. In some sections the plain top knee length stocking has made considerable headway, but it seems to be the impression of dealers that women who wear the knee length prefer the roll top and that the inclination is toward the full length, to be rolled by the wearer, rather than the ready-rolled. Embroidered roses, birds, and other designs just below the knee make an appeal to a restricted class, but stockings of this type are not regarded a safe proposition for other than nearby sale.

A novelty stocking for women brought out recently and bought up extensively by a few of the larger jobbers in each of several hosiery market centers is in a jumble of colors bordering on light. This line is knitted in-grain, of rayon, and is described by the one house handling it as of "iridescent yarn." The effect simply is the result of a somewhat tedious dyeing process.

A winning number with one of the large mills selling the retail trade direct is of rayon, fully-fashioned foot on a

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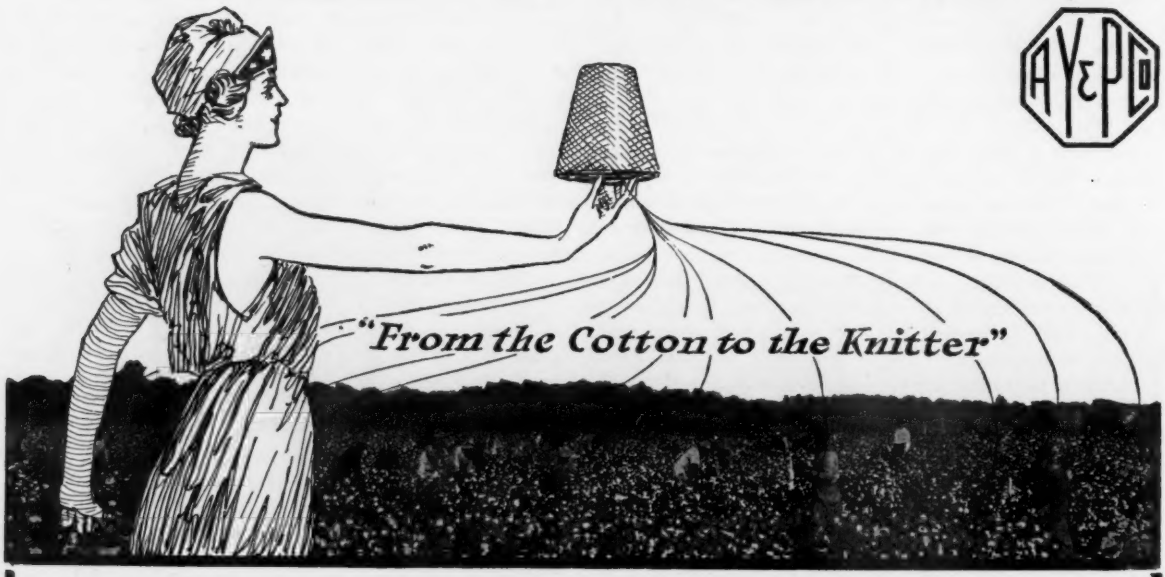

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spring needle leg. Being tightly knitted and carrying the fashion marks from top to toe, it is a fetching $1.50 a pair stocking. The mill making it also manufactures one or two other special numbers, and is declining some business and adding full-fashioned equipment. Its volume of business in seamless silk lines increased by 10 per cent in April over March, and May showed a substantial gain over April.

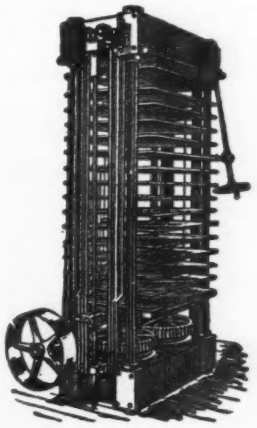
Only a few of the novelties brought out in very recent years remain. One of these is the patented heel number of the Cadet Knitting Co., Philadelphia. It is a full-fashioned stocking and goes over the counter at around $2.50 a pair. The dark line of juncture of the heel with the foot and leg is the prime factor in the success of this stocking, which was brought out to compete with the Pointex. It now is as staple as the plain silk, according to the manufacturers, who during the first quarter of the year are said to have declined almost 30 per cent of the business that was offered.

In the opinion of a manufacturer, probably speaking from experience, the more satisfactory business, from the standpoint of volume, is passing to mills in which there is strict adherence to standards and prices are made to fit the goods rather than goods being made to fit a price. But it is admitted that manufacturers following this policy are selling in competition, which leaves the inference that it is being adopted by numbers, on the theory that a steady volume of business showing a small margin of profit per unit is preferable to larger profits that might be gotten out of inferior merchandise for a time, leaving the manufacturer later to look for business to keep his plant in operation.

A representative mill in which the boast is made that its goods never are cheapened to meet a buyer's price notion, sells a comparatively few large establishments. But they are steady customers, pay the price and meet their invoices in 10 days. Knowledge of the success of this mill in the matter of getting and holding business seems to have reached a considerable number of mill agents, for last month, by actual count, eleven visited the mill in the hope of procuring the account. Most of his product is sold direct. The mill makes only staple spring needle goods.

While, according to manufacturers selling to retailers, there is no great rush for novelties in women's silk hosiery, colors will continue to be worn, judging from their present popularity. There are perhaps 75 descriptive terms for hosiery shades, but the shades selling in a large way probably are embraced within less than a dozen descriptions. Black hosiery is almost as scarce as palm leaf fans about Christmas. White was still moving to the front last month, and while giving promise of being worn somewhat extensively during the summer, is not expected to make serious inroads on colors. Northern factors say white is not making much of an appeal in the south, where, it is said, nude and beige have the swing, as they have generally.

Manufacturers of women's full-fashioned silk hosiery say there was a decline last month in the volume of orders coming through, but mills appear to be as busily engaged as at any time since the first of the year. Many of them have orders in the books for deliveries running through October, and the Co-ed, a small mill in Philadelphia, is reported sold up to the first of the year. While some manufacturers are well booked up, it would appear that as an average a slowing down of plant operation may be expected during the summer there shall be another period of buying for future.



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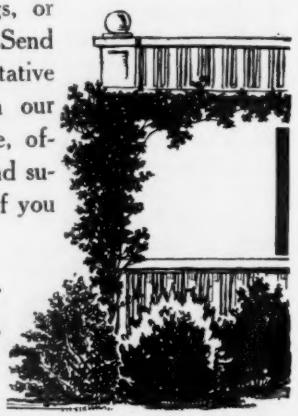

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as by that time most of the mills probably will have completed the orders on the books, even those for delivery in the early Fall.

Notwithstanding the belief expressed by some leading factors that at the present rate of expansion of the full-fashioned industry there is likely to be an over supplied market, numbers of small mills are adding to their equipment and some which hitherto made only seamless goods are installing flat machines. The Rodgers Hosiery Company, for example, disposed of its spring needle machines and is increasing the full-fashioned equipment. Another mill in Philadelphia, a smaller establishment, shortly will install three full-fashioned machines, and will increase the number before the end of the year. The Cadet Knitting Company is adding two flat machines per month, for a total of eight. These represent but a small fraction of the mills that either are making their first appearance in the full-fashioned field or are adding machines.

Price is selling full-fashioned hosiery. A good nine strand stocking of standard length boot is available to go over the counter at $1.50 a pair, which is but a quarter more than most shops expect to get for spring needle goods. While in latch needle silk hosiery, and in rayon as well, the trend seems to be toward twelve to fourteen strands, some interests figure that full-fashioned will center mainly on eight to nine strand. But it is admitted that what today looks like a prospective winner may be out of the running by tomorrow.

Although demand for novelty hosiery, more especially for men, continues strong, manufacturers are proceeding more cautiously, not because novelties are waning, but for the reason that as so many patterns have passed out after a brief but profitable career, many of the current designs will go the same way. A mill may be busy with one or two patterns, have idle machinery and not put it to work, lest the goods become too plentiful. The big business in novelties undoubtedly was built up on a somewhat restricted output, leaving buyers to scour the market for goods rather than putting manufacturers in a position where they would have to look for buyers.

It is the idea of some manufacturers that instead of knitting stripes and squares it were better to turn hosiery in the gray over to a printer, in order to make frequent changes in patterns without changes in the machinery. At the moment there is good call for printed half hose in silk and rayon mixture and in mercerized in mixture. The call is for colors conforming to those in collegiate hat bands and neckwear. It is stated by one representative concern that the better results are obtained by printing on ribbed hosiery or knitted with a needle out; that the effect is more pleasing than if the printing be done on a flat surface.

A person speaking as a representative of one of the larger nationally known jobbing houses says that in his opinion printed novelties are giving evidence of a decline in public favor. He points out that some printed silk-and-wool hosiery has been sold for Fall and that there are interests which doubt whether it will be popular when the time comes for wearing it. But, he says, "no one can tell." This person, who also occupies a close connection with a well known mill, had some experience with novelties for women earlier in the year, and because of that experience is pinning his faith to staples of silk and silk in combination with rayon.

Reports which would indicate that there is less pressure

FALLS

in mills, both on stairs and on the level, are responsible for a very high percentage of fatalities and of lost time claims. One fatality in the course of a year results in a big increase in compensation insurance. The loss of trained workmen even for a day slows up production.

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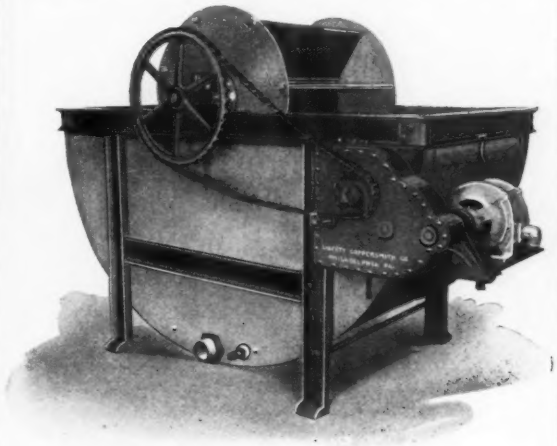

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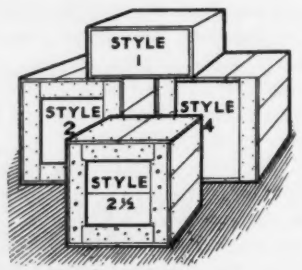

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on manufacturers for silk hosiery than a few months ago come from commercial dyers, some of whom say they are receiving less work from mills. This might be true and yet not be in contradiction of the statement that manufacturers are as busy as ever, for it is apparent that it will be some time before they will receive color specifications for deliveries a few months hence. Mills may be running at top notch, leaving the product in the gray to be dyed as specifications are received.

The market for low end hosiery is rather quiet. There is little or no interest in this class of goods for Fall and, seasonally speaking, they are practically off the counters. Prices apparently are steady, however, and no violent fluctuations are looked for. Plain mercerized, for men and women, is in light call, but about holding at prevailing prices.

In some mill lines of juvenile hosiery there has been a tight situation. A few manufacturers last month were declining nearby delivery orders and some were receiving cancellations because of deliveries having become past due. Several mills making the better grade of infant socks are especially under pressure for deliveries. It is noted in a government report that production of juvenile hosiery was slightly less in March last than in the corresponding month of 1924.

Perhaps the better index of the state of the hosiery market as a whole is that supplied by manufacturers selling direct to retailers. A number of these mills are known to have had as great a volume of business to the middle of May as for the entire first six months of last year. Another indication of strong consumer buying is the fact that concerns selling from door to door through canvassers are having a far larger business than last year. The Real Silk Hosiery Company, the pioneer among direct sellers and the only one manufacturing in a large way, was a heavy buyer of full-fashioned hosiery last month and offered business to several mills which were so well sold ahead as they could not accept it. The Real Silk, it will be recalled, until last year sold only seamless hosiery. It now is operating two full-fashioned mills and is buying from large concerns which ordinarily sell only to jobbers.

It will not be overlooked that in this year's boom hosiery market there lies a possibility of eventual over production. Every glut in the market has had its beginning during just such conditions as have existed this year.

Underwear.

Light weight underwear for immediate and nearby delivery is scarce. This was made apparent to jobbers and retailers during the few warm days in May. Most of the retailers have bought very lightly and it appeared their meager stocks soon melted away under scorching temperatures. They found jobbers with limited supplies, but in most cases were able to pick up goods for their immediate requirements. But during succeeding periods of cooler days and nights these same retailers, broadly speaking, were no more interested in putting light weight underwear in stock than in contracting for winter weights.

From what can be gathered it appears that the stocks of jobbers are as low, relatively, as are those of retailers, and jobbers themselves found it difficult to make replacements on short notice. Probably a half dozen Pennsylvania manufacturers were in Philadelphia and New York last month offering women's light weight cotton garments, but not one had goods for at once delivery. One manufacturer explain-

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ed, "It is not good business to have underwear in stock. We are manufacturing only on orders." This sentiment seems to prevail among Pennsylvania manufacturers, most of whom had trying experiences in the last few years, and it is inferred that mill owners as a body are taking the stand that they no longer will carry the bag for the retailer; that if merchants believe it dangerous to put goods in stock it is not altogether safe for manufacturers to do so. Jobbers themselves doubt whether there is much spot underwear to be picked up.

Sales of women's artificial silk underwear are fast increasing. So long as retailers declined to put the gauzy fiber garments in stock, jobbers themselves were slow to become enthusiastic over them. "But we are coming to them," said the buyer for a representative jobbing house, "and the retail trade is slowly putting them into stock." A jobbing house, which last year had its first experience with artificial silk underwear is selling not only to retailers but to concerns employing door-to-door canvassers. At one jobbing house it was stated, "Our best customer for women's artificial silk underwear is a direct-to-consumer seller, employing only a few canvassers."

Men's knitted light weight underwear, in ribs and bal briggans, is not in good supply for at once shipment. Jobbers discovered this when they placed re-orders following the brief warm periods last month. In fact there are instances of tardy deliveries against orders placed as long ago as February. A concern with fifteen cases on order for shipment in February and March was five cases short last month and urged the mill to rush shipment. The mill replied that the best they could do would be to put the goods in transit in ten days.

So long as jobbers have fair stocks of goods bought early they are not disposed to place duplicate orders until they have sold the bulk of these stocks. They are waiting for the retailers. The retailers are waiting for the customer. As other lines of cotton goods have advanced in price, dealers have been urged to not defer their underwear purchases, lest prices in this division also be moved up, as was the case with nainsook athletic suits.

Jobbers who last month placed re-orders for nainsooks found that several manufacturers had advanced their prices by 12½ to 25 cents a dozen. It developed that there is a scarcity of spot delivery 72-80 goods, several manufacturers of nationally known branded lines refusing to promise delivery inside of three weeks.

Winter underwear is stagnant. Jobbers in the West who ordinarily make a practice of going to their trade early with especially attractive prices are understood to have sold considerable stuff. In the East, according to reports from representative houses, very few retailers have made committments for winter weight underwear, of which not many dealers in the South have bought. In the circumstance, jobbers are deferring further committments until they see a need. It is believed most of them have the bulk of what they have taken in against initial orders placed in November and December last. Ordinarily, manufacturers book duplicate orders during May and June. It is the general opinion the duplicate business for next winter will be placed much later than usual.

The light weight situation is well in hand, so far as relates to manufacturers and jobbers. There may be a squeeze later—probably will be with the advent of seasonal weather for a long pull—but retailers will be the more severely squeezed. The latter recall that the season was late in 1924 and seem to be obsessed with the fear that 1925 is to witness a repetition. When reminded of the danger of delay in stocking up, a dealer will say, "All right; I'll pay more if I cannot get goods at present prices, but I'm not going to buy till I have sold what I have." This is the attitude that is holding transactions in the underwear primary market in check.

The market for sweaters, quiet for some time, seemed to gather some little momentum in May, with a broadening use of artificial silk for mixture in garments for Fall and Winter. Manufacturers have been buying worsted yarns at prices showing a loss to spinners, but contracted for no yarns for future, for one reason, spinners refused to sell far ahead at the prices obtainable. Steady declines in wool acted as a deterrent to operations in worsted sweaters, which have been the backbone of the heavy weight business. Wool last month was believed to have gone to near the bottom, and it was believed that once yarn prices become stabilized on a low level there will be freer operating in sweaters by jobbers and retailers. Certain popular types are in fairly good call, but these cover only a small part of the trade possibilities. To last month, business in sports sweaters for Spring and Summer was disappointing to manufacturers and jobbers.

Alarm Unnecessary.

There is believed to be unnecessary alarm among manufacturers of seamless made silk and artificial silk hosiery over the decision of the British Government to impose a tariff on all hosiery of silk and of rayon imported from the United States. Manufacturers who will be directly affected by the duty on imports say they have had no official information, but it is the common understanding the duty will amount to about 25 per cent of invoice value and will be effective on and after July 1st, in probably all ports of the United Kingdom.

It is noted that British interests have been taking in American hosiery in considerably larger quantity, probably in preparation for maintaining for a time in their home markets the current level of prices. Exports in March were 178,141 dozens of artificial silk, an increase of about 47,000 over January. Exports of natural silk hosiery in March were 109,728 dozens, comparing with 65,676 dozens in January. Of these totals, approximately 50 per cent represented exports to the United Kingdom. If our foreign trade shall materially decline by reason of British importers being compelled to pay a duty, the result of this would be keener competition among American manufacturers for the home trade. It is pointed out that, even with the addition of 25 per cent import duty, British merchants would be paying us no more than a few years ago when the price of raw silk was higher.

England and Australia have been large importers of American knitting machines, one well known establishment in Sidney having contracted for full-fashioned machines, some of which have been shipped. It would appear that the outlook is for diminished shipment to British ports, but some manufacturers insist that this falling off can be offset by increasing our exports to South American countries.